

PRELIMINARY SITE ENGINEERING REPORT

For the
Archuleta County Justice Center

Prepared
June 18, 2020

By
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PRELIM. SITE ENG. REPORT – Archuleta County Justice Center

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1.0 INTRODUCTION

Archuleta County desires to construct a new Justice Center (JC) facility on a nearly five acre parcel of land being Lot C of the Harman Park Subdivision. This property previously was entirely an “Open Air Museum” consisting of old, re-erected buildings in varying condition. Presently, a new Detention Center (DC) facility is under construction on the eastern portion. The property is located in Section 15, T. 35 N., R. 2 W., N.M.P.M. within the Town of Pagosa Springs, Colorado (see Figure 1 – Vicinity Map). This parcel of land is adjacent to and south of Harman Park Drive, which has access to U.S. Highway 160 at a fully signalized intersection. The present plan includes the JC addition to the site, and has been created with significant grading detail. It is anticipated that final revisions to this plan may incorporate minor site adjustments, but primarily will incorporate survey and layout data and possibly utility service modifications. It is not anticipated that these revisions will significantly affect the function or other issues discussed herein (see Appendix A for half-sized copy of current plan). Within this document we will discuss project utilities (particularly water and sewer), vehicle and pedestrian handling, and site grading and drainage.

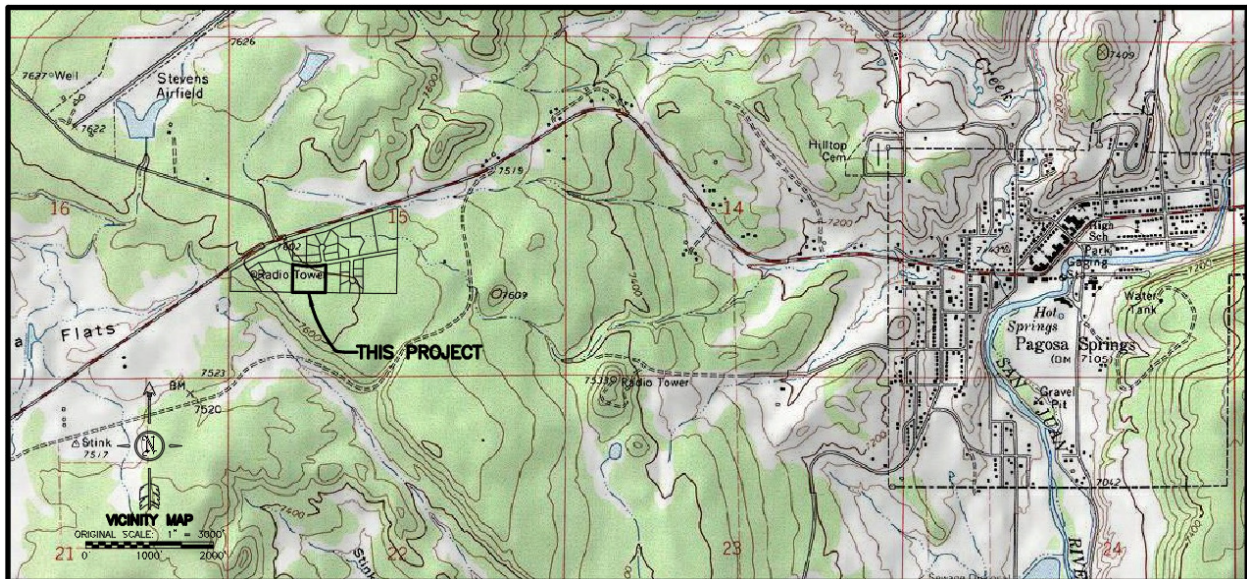


Figure 1 – Vicinity Map.

2.0 UTILITIES

A project utilities meeting still needs to be held with the various providers and stakeholders, which may include representatives from Pagosa Area Water and Sanitation District (PAWSD), Harman Park Subdivision, Pagosa Springs Sanitation General Improvement District (PSSGID), Black Hills Energy, La Plata Electric Company (LPEA), Pagosa Fire Protection District (PFPD), Town of Pagosa Springs (TOPS), and Reynolds, Ash & Associates (RAA). Planned service connections indicated at this point are based on previous conversations and surface stub-out evidence. As with the DC project, all utilities necessary are located in relatively close proximity. It is planned that water and gas connections will be required on the mains located north of Harman Park Drive. This may also be necessary for electricity if three phase power is required. Details concerning utility provision will be refined with the various providers as the project progresses. Additional information concerning water and sewer are discussed in the paragraphs which follow.

2.1 WATER

PAWSD will be the provider of water for the project. It is understood that a potable water service line exists in the northwest corner of the site, and an eight inch diameter water main is located on the north side of Harman Park Drive. It is planned to use the existing service for the potable connection for the project. For fire water, a pipeline is planned to be extended across Harman Park Drive for connection to the main for fire hydrant and building sprinkler system supply.

2.1.1 AVERAGE and PEAK WATER DEMAND

The impact of the development on the PAWSD water system has been conservatively estimated for this review using 15 gallons per person per day working at the facility, and 5 gallons per day per person visiting. It is understood that the facility will have a maximum of 25 employees, and a maximum occupancy of 425, resulting in a maximum of 400 visitors.

$$\begin{aligned} &25 \text{ people} * 15 \text{ gallons/person/day} + 400 \text{ people} * 5 \text{ gal./per./day} = 2,375 \text{ gallons per day} \\ &2,375 \text{ gallons/day} * 1 \text{ day/24 hours} * 1 \text{ hour/60 minutes} = 1.65 \text{ gpm average demand per day} \\ &\text{Average demand for an 8 hour work day} = 4.95 \text{ gpm} \end{aligned}$$

A factor of 4 was applied to the average rate per 8 hour work day to determine the peak demand as calculated below:

$$4.95 \text{ gpm 8 hr. day average demand rate} * \text{peak demand factor of 4} = 19.80 \text{ gpm peak usage}$$

Peak water demands should be reviewed in selecting master meters. Final peak demand shall be verified with the project MEP engineer and PAWSD, as appropriate, which may affect both the project meter and potable water line size.

2.1.2 FIRE WATER REQUIREMENTS

As previously mentioned, a potable water service exists at the northeast corner of the lot, with an eight inch water main on the north side of Harman Park Drive. The potable water service is expected to be 2 inch diameter, which is insufficient for the fire water supply. As such, the eight inch water main will be tied-into and extended to the building for the internal sprinkler system. It will also be extended to a new fire hydrant, which is anticipated to be requested by the PFPD to be installed on the west side of the proposed driveway entrance to the JC. No concerns were raised during the previous utility meeting for the DC on fire flows available within the subdivision. One hydrant was added at the westerly entrance to the DC (middle access to the site), and other hydrants exist in relatively close proximity, with one across Harman Park Drive at the northwest corner of the intersection with Papoose Court, and another down Harman Park Drive to the east at the northwest corner of the intersection with Ryder Court. If any modeling of the system is required, a request should be made to PAWSD.

2.2 SEWER

The Harman Park Subdivision has a private small diameter pressure sewer system which conveys effluent to the Pagosa Springs Sanitation General Improvement District (PSSGID), which will be the acceptor of sanitary sewage generated by this project. It is understood that a service connection to the pressure sewer system is located in the northeast corner of the subject parcel. It is planned to have a gravity sewer collection system for the site facilities which conveys sewage to a low flow, high pressure grinder pump to be located relatively close to the service connection. Final details on connection to the Harman Park Subdivision Sewer System will be coordinated with owners thereof as appropriate.

2.2.1 SANITARY SEWAGE GENERATION

The impact of the development on the Harman Park Subdivision Sewer System, and ultimately the PSSGID sewer infrastructure is based upon the following:

Assuming all potable water demand returns as sewer flow, or 2,375 gallons per day.

$$\begin{aligned} 2,375 \text{ gallons/day} * 1 \text{ day/24 hours} * 1 \text{ hour/60 minutes} &= 1.65 \text{ gpm average flow rate} \\ \text{Average flow rate for an 8 hour work day} &= 4.95 \text{ gpm} \end{aligned}$$

The estimated BOD generation for the development is calculated at 220 mg/L as follows:

$$220 \text{ mg/L} * 1 \text{ lbm}/453,600 \text{ mg} * 3.7854 \text{ L/gallon} * 2,375 \text{ gallons/day} = 4.36 \text{ lbm of BOD/day}$$

The peak generation rate for 8 hour work day on-site using a factor of 4 is:

$$4.95 \text{ gpm} * \text{peak generation factor of 4} = 19.80 \text{ gpm peak generation rate}$$

As previously mentioned, the existing system in the subdivision is a small diameter pressure sewer, which will require an e-one or similar type grinder pump. It is recommended for this type

of facility that the system be an alternating, duplex pump setup connected to the building emergency power. E-one has package duplex pump systems, such as the WH482-122 with a Duplex Protect Plus control panel that are capable of handling up to 3,500 gallons per day (Note, the plan shows a WH484-122, which was used for DC project and has double the capacity, which should not be necessary for the JC). While no issues are anticipated, the estimated sewage generation data should enable the PSSGID to determine the ability to provide service and anticipate impacts.

3.0 VEHICLE AND PEDESTRIAN HANDLING

3.1 ACCESS

The project will be accessed from Harman Park Drive. The subject JC project will primarily utilize the proposed westerly access to the site, with other connectivity internal to the site available via parking lots and driveways.

3.2 DRIVEWAYS

As previously mentioned, the western drive will be the primary entrance, and has been designed for 24 feet wide asphalt with curb and gutter on both sides. This access point leads to a drop off roundabout for the building main entrance on the northwest corner. Several parking lots can be accessed from this driveway. The large parking lot on the north side of the building then has additional driveway connection to the middle access to the site and the DC parking. The driveway extends along the west side of the building with additional perpendicular parking stalls on both sides. The driveway then continues as a security, delivery, and fire lane on the south side of the site at 15 feet wide asphalt surface with access to shared employee parking between the JC and DC facilities. Curb and gutter is incorporated throughout, framing the drives and parking in addition to functioning as drainage conveyance.

3.3 PARKING

The parking requirements for a JC are not specifically outlined in the TOPS Land Use Development Code (LUDC). In the Institute of Transportation Engineers (ITE) Parking Generation Manual, only one study was performed for Land Use 735 (Judicial Complex). Using the general guidance for a government facility in the LUDC of 1 space per 300 square feet of building for nearly 22,500 square feet (future maximum expansion) yields 75 parking spaces are necessary. The Architect had discussions with the Owner where it was requested that as many parking spaces as could reasonably be accommodated be incorporated in the site to handle jury duty calls.

The present plan generally incorporates three parking areas. The first is the parking area on the north side of the building which contains 45 stalls. The second is the perpendicular parking along the access drive on the west side of the building which includes 41 stalls (including the 8 near Harman Park Drive). The third is the shared parking lot between the JC and DC facilities which has 18 stalls. Therefore, in total the plan incorporates 104 stalls. There are 4 ADA Van

Accessible spaces incorporated in the spaces on the west side of the building, and 2 stalls in the shared parking between the JC and DC buildings.

3.4 TRAFFIC GENERATION

As previously mentioned, the JC will have a maximum of 25 employees primarily for one 8 hour shift, and in the future may be nearly 22,500 square feet. Trip generation has been estimated using the Institute of Transportation Engineers (ITE) Trip Generation manual, 10th Edition. No studies were available for the previously referenced Land Use 735 (Judicial Complex), so Land Use 730 (Government Office Building) was used. It appears for the various conditions that 6 to 8 studies were performed. The Average Daily Traffic (ADT) is estimated using the following equation:

$$X * (22.59) = T, \text{ where } T = \text{number of trip ends, } X = \text{gross floor area in 1,000's of square feet}$$

Substituting 22.5 for X and solving for T = 508 ADT

The AM Peak Hour (of Generator) is estimated using the following equation:

$$X * 3.69 = T, \text{ Where } T = \text{number of trip ends, } X = \text{gross floor area in 1,000's of square feet}$$

Substituting 22.5 for X and solving for T = 83 AM Peak Hour Trips

The distribution of these AM trips is 55% entering and 45% exiting, or 46 vehicles entering and 37 vehicles exiting.

The PM Peak Hour (of Generator) is estimated using the following equation:

$$X * 3.19 = T, \text{ Where } T = \text{number of trip ends, } X = \text{gross floor area in 1,000's of square feet}$$

Substituting 22.5 for X and solving for T = 72 PM Peak Hour Trips

The distribution of these PM trips is 43% entering and 57% exiting, or 31 vehicles entering and 41 vehicles exiting.

It should be noted that these estimates are likely more reflective of when jury calls are made, where significant trips to and from the site will occur and the building occupancy will be at its highest. Outside of a jury call and while court is in session, traffic is likely to be less than 50% of the indicated values, and with no court in session, traffic is likely to be less than 25% of the indicated numbers. As previously mentioned all traffic to and from the site will be via Harman Park Drive to and through the intersection of U.S. Highway 160. Ultimately the extension and connection of Harman Park Drive as a frontage road will potentially help alleviate the need for all traffic to utilize the Highway.

3.5 PEDESTRIAN HANDLING

A 5 foot wide concrete sidewalk was installed with the original subdivision construction abutting the concrete curb and gutter on the north side of Harman Park Drive. As part of the DC project, 5 foot wide sidewalk was added to the easterly portion of the site frontage on the south side of

the street. For the subject JC project, the sidewalk will be completed along the westerly portion of the Harman Park Drive frontage.

A connection to this street-side sidewalk will be made on the east side of the driveway access being added for the subject project. An 8 foot wide sidewalk beginning at Harman Park Drive initially is detached from the curb and gutter, and becomes adjacent to the curb and gutter about half way to the building entrance. An employee break area patio is included between this sidewalk and the north parking area. At the building, a hardscape plaza is planned, with a stairway connection down to the north parking area on the east side. The 8 foot wide sidewalk then continues from the entrance along the west side of the building to the south end of the “public” parking stalls. Three additional sidewalk accesses to the building are included on the west side, with another employee patio area at the center one. The plan includes 5 foot wide sidewalks adjacent to the curb on both sides of the shared parking area between the JC and DC buildings, connecting to building access points as appropriate. A final egress sidewalk and stair is included on the east side of the building, connecting to the sidewalk installed as part of the DC project.

4.0 GRADING AND DRAINAGE

The existing topography of the site generally slopes down from the southwest to the northeast, from the back of the parcel towards Harman Park Drive. Drainage is conveyed on the south side of Harman Park Drive to two 12 inch CMP culverts located at the northeast corner of the lot, which directs runoff under the driveway for the church property to the east. All site runoff will ultimately be conveyed to this point.

As part of the DC project, a series of 18 inch CMP culverts were installed along the Harman Park Drive frontage, slated to carry the off-site and mitigated on-site runoff, with a project specific detention pond incorporated in the DC site.

4.1 OFF-SITE DRAINAGE

A small amount of off-site drainage may enter the subject property from the south side, however the contour lines tend to indicate that the slope to the south gets to be more and more to the east. A perimeter berm is planned for the west side of the project to separate off-site and on-site flows, with off-site runoff directed towards the roadside, where a separate conveyance will be maintained apart from the on-site drainage until on-site peak flows can be mitigated again with a project specific detention pond.

4.2 ON-SITE DRAINAGE

The subject JC project on-site drainage will be collected and peak flows appropriately mitigated. The supposed “regional” detention facility for the subdivision is located to the east and on the north side of Harman Park Drive on Lot F. As with previous projects in the area, TOPS is not familiar with how that facility is intended to function, and it seems problematic to convey unmitigated flows to that location. As such, a project specific detention facility is proposed as

previously mentioned and has been incorporated in the current site plan. It should be noted that this is a separate evaluation and detention pond from that for the DC project.

4.2.1 RAINFALL ESTIMATE

In general, historic precipitation data is used to generate rainfall depths over a given area. Precipitation events are gauged by depth for particular return storm duration and return year. This data is available from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, which covers Colorado. Typical storm duration data is 6 or 24 hour, with rainfall intensities higher for shorter duration storms. Specific site precipitation estimates are available on-line, with a copy of the data used for our analyses included in Appendix B. For the purposes of this report we are using the 24 hour storm data. A summary of the precipitation depths of primary concern is shown in the table which follows:

24 Hour Precipitation Event	Precipitation Depth (in.)
2-year	1.68
100-year	3.43

Figure 2 – Precipitation Depths for 2-year and 100-year 24-hour events.

4.2.2 SITE SOILS

The NRCS Web Soil Survey site was used to determine the existing site soils. The area is comprised primarily of Valto, a very stony fine sandy loam, with a lesser portion of Fort Lewis, a fine sandy loam in the southwest corner, both of which are classified as a Hydrologic Soil Group (HSG) D. A copy of the NRCS Web Soil Survey output is contained in Appendix C.

4.2.3 DRAINAGE BASIN DELINEATION

As previously mentioned, the eastern portion of the site was developed for the DC project, with the western portion now being considered for the JC project. As such, the drainage basin boundary was determined to be that portion of Lot C associated with the JC improvements. All of the area generally slopes and drains towards the northeast, being collected at the upstream end of an 18 inch diameter CMP culvert which was installed as part of the DC project.

One principal surface type was used for the undeveloped site, being woodlands and grass (poor), due to spread out trees and sparse grass with significant rocky areas. Two surface types were used for the developed condition, being grassland (good), and impervious (asphalt, concrete, roofs, etc.). For the fully developed condition, the grassland (good) classification will require that non-hardscape areas have native grasses established with good coverage, or that other landscaping features be incorporated which can similarly slow runoff, such as mulched planting areas. A tabulation of the drainage basin characteristics is contained in Figure 3, and sketches (including future building expansion for the developed condition) are contained in Figure 4.

Drainage Basin	Vegetated Area (ac.)	Impervious Area (ac.)	Total Area (ac.)	Drainage Length (ft.)
Pre-developed JC site	2.211	0	2.211	508
Developed JC site	1.53	0.681	2.211	515

Figure 3 – Drainage basin data.

The property boundary has been used as the exterior drainage basin boundaries on the north, south, and west, with the split between the JC and DC projects used on the east. The sketches below depict the undeveloped and developed JC portions of the site. It should be noted that minor modifications to the site occurred between the modeling and Design Development (DD) plan set, which shouldn't significantly affect the results. The balance of the site was included in the DC project analyses and detention pond.

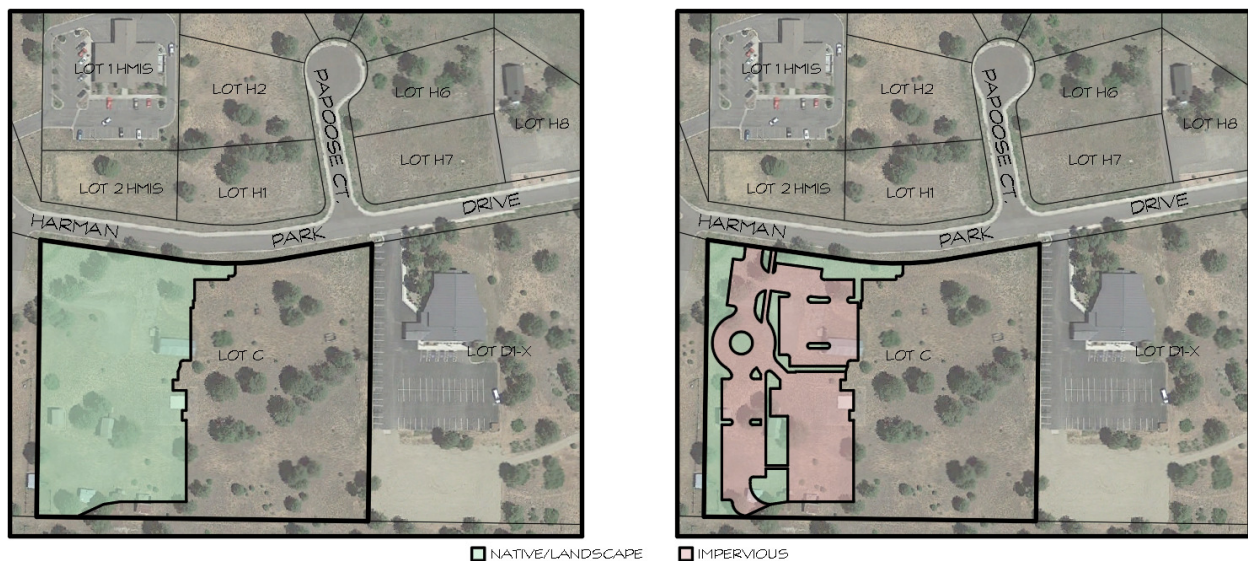


Figure 4 – Pre-developed Justice Center (JC) portion of the site (left) and developed site (right).

4.2.4 RUNOFF ANALYSIS

Peak runoff values were determined using Natural Resources Conservation Service (NRCS) Curve Number (CN) method and unit hydrograph utilizing the HydroCAD program. Time of concentrations (Tc) for each sub-basin were determined by a combination of sheet flow, concentrated shallow flow, channel flow, and/or pipe flow as appropriate. The CN values calculated for each basin are the weighted average using a CN of 86 for woodlands and grass (poor) HSG D, 80 for grassland (good) HSG D, and 98 for the impervious areas (buildings, concrete, asphalt, etc.). The basin parameters used in HydroCAD are listed in Figure 5.

Drainage Basin	Weighted CN	Tc (minutes)	Peak Runoff (cfs)	
			2-year	100-year
Pre-developed JC site	86	26.8	1.21	4.19
Developed JC site	95	8.4	3.38	8.72

Figure 5 – CN and Tc used and HydroCAD output for each basin.

The 100-year event peak flow from the pre-developed site of 4.19 cfs, will be the historical discharge limit used in sizing the detention pond volume and associated outlet structure. Select HydroCAD output is contained in Appendix D, with additional data available upon request.

4.2.5 PEAK FLOW MITIGATION – DETENTION POND

A detention pond has been incorporated in the current plan just south of Harman Park Drive between the proposed drive for the JC and the westerly drive for the DC. Off-site runoff will be conveyed in a channel between the sidewalk and the proposed detention pond, with the outlet from the pond designed to occur just upstream of the 18 inch diameter CMP culvert which was added as part of the DC project.

Initial detention pond sizing was estimated using NRCS TR-55. Calculating the peak runoff ratio of pre-developed (4.19 cfs) to the developed (8.72 cfs) condition yields 0.48. Figure 6-1 for a Type II storm shows this equates to a ratio of 0.29 of the storage volume required as compared to the total storm runoff. For the total storm runoff at 0.473 acre-feet, this equates to a storage requirement of nearly 0.137 acre-feet or 5,949 cubic feet. We have found that the TR-55 estimate tends to be conservative, and further refined the pond configuration by additional modeling in HydroCAD, with routing the runoff through the pond and outlet structure, which consists of an orifice plate limiting flow to 4.19 cfs or less for the mitigated pond depth for the 100-year event, with an emergency overflow beyond the required storage.

As such, the final pond configuration ended up with approximately 5,310 cubic feet of storage below the emergency overflow, with the 100-year storm filling the pond to 5,021 cubic feet at 0.11 feet below the emergency overflow elevation, with the outlet flowing at 4.01 cfs. HydroCAD modeling data for the detention pond is included in Appendix D. On the downstream side of the outlet structure, an 18 inch diameter CMP culvert is proposed for emergency overflow. For the project configuration, the emergency overflow capacity is around 12 cfs, or approximately 286% of the allowable release rate and 138% of the developed 100-year peak.

5.0 SUMMARY

All of the necessary utilities for the project are in the immediate vicinity, and it is believed that adequate capacity exists as this is a relatively new subdivision. The utility companies will be consulted as the project continues through design to reflect proper off-site and on-site configuration and routing. PAWSD owns the water infrastructure, and the sewer is privately owned by the subdivision, with PSSGID accepting the effluent in their system. It is anticipated that an additional fire hydrant will be requested by the PFPD on the west side of the west driveway. Vehicle and pedestrian access to the site will be via Harman Park Drive, with traffic impact at most by the JC being the addition of 508 vehicles per day, likely only on jury call days. Off-site drainage should not impact the project, and on-site drainage will be maintained primarily on the surface via curb and gutter and drainage swales. On-site runoff for the developed portion of the site will be collected and conveyed to a detention pond to mitigate peak flows. The detention pond has been designed for the future additions to the south side of the building.

Appendix A

DES Site Plan – Half-size Copy

- NO EXCAVATION OR WORK SHALL BEGIN UNTIL THE CONTRACTOR HAS OBTAINED, AT HIS EXPENSE, ANY PERMITS REQUIRED TO PERFORM THE PROPOSED WORK.
- 2) ALL SITE-WORK SHALL BE IN CONFORMANCE WITH PROJECT SPECIFICATIONS AND TOWN OF PAGOSA SPRINGS STANDARDS, WITH QUALITY ASSURANCE TESTING DOCUMENTATION RECOMMENDED FOR COMPACTION, AGGREGATES, HOT MIX ASPHALT (HMA) AND CONCRETE.
- 3) A SITE SPECIFIC GEOTECHNICAL EVALUATION REPORT WAS PREPARED BY YEH AND ASSOCIATES, INC., DATED APRIL 8, 2019.
- 4) THE CONTRACTOR SHALL NOT DISTURB AREAS BEYOND THE PROJECT LIMITS UNLESS OTHERWISE DIRECTED BY THE OWNER.
- 5) THE ANTICIPATED DISTURBANCE AREA IS APPROXIMATELY 2.9 ACRES IN SIZE. THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A STORM WATER DISCHARGE PERMIT FROM THE STATE OF COLORADO. THE CONTRACTOR SHALL MAINTAIN DRAINAGE DURING CONSTRUCTION IN ACCORDANCE WITH THE STORM WATER MANAGEMENT PLAN OR AS DIRECTED BY THE ENGINEER. ANY REWORK OF MATERIALS DUE TO LACK OF THIS MAINTENANCE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- 6) COMPACTION AND MOISTURE CONTROL IN NATIVE AND AGGREGATE MATERIALS SHALL BE PERFORMED AS INDICATED IN THE PREVIOUSLY REFERENCED GEOTECHNICAL EVALUATION REPORT.
- 7) CLEARING AND GRUBBING SHALL INCLUDE REMOVAL OF ALL TREES, LOGS, LIMBS, STUMPS, BRUSH, TRASH, ETC. TO AN OFFSITE LOCATION. TREE REMOVAL SHALL INCLUDE THE ROOTS.
- 8) WHERE NEW ASPHALT PAVEMENT IS TO ABUT EXISTING PAVEMENT, THE CONTRACTOR SHALL SAW-CUT THE EDGE OF THE EXISTING ASPHALT MAT TO PROVIDE A CLEAN JOINT BETWEEN EXISTING ROADWAY AND ASPHALT PATCHES OR TIE-INS. TACK COAT SHALL BE APPLIED TO ALL ADJACENT SURFACES WHERE A TIGHT JOINT IS DESIRED.
- 9) ALL ASPHALT PROVIDED FOR THIS PROJECT SHALL BE A MIX DESIGN THAT HAS BEEN APPROVED FOR MUNICIPAL PROJECTS WITHIN TWO YEARS APPROPRIATE FOR THIS CLIMATE AND THE INTENDED USE. HOT MIX ASPHALT (HMA) SHALL BE COMPACTED TO 92% TO 96% MAXIMUM THEORETICAL DENSITY, AND SHALL HAVE PROPER GRADATION, OIL, AND VOIDS AS APPROPRIATE FOR THE MIX BEING USED.
- 10) THE MIX FOR ALL EXTERIOR CONCRETE SHALL BE PROPORTIONED TO OBTAIN A MINIMUM OF 4,500 PSI AFTER 28 DAYS (SUCH AS A CDOT CLASS D, OR EQUIVALENT), CONTAIN PROPER AIR ENTRAINMENT, CONTAIN FIBERMESH, SHALL HAVE A SLUMP BETWEEN 2 AND 5 INCHES, AND SHALL BE GIVEN A LIGHT BROOM FINISH. EXPANSION JOINTS IN CURBS SHALL BE PLACED NO GREATER THAN EVERY 200 FEET, AND CONTROL JOINTS SHALL BE PLACED EVERY 10 FEET. EXPANSION JOINTS IN SIDEWALKS SHALL BE NO GREATER THAN EVERY 200 FEET, AND CONTROL JOINTS SHALL TYPICALLY MATCH THE SIDEWALK WIDTH, BUT MAY BE SHORTENED TO MATCH CURB CONTROL JOINTS. IN NO CASE SHALL CONTROL JOINTS IN ANY CONCRETE FLATWORK BE SPACED MORE THAN 15 FEET APART. STRUCTURAL REINFORCEMENT SHALL BE DISCONTINUOUS ACROSS EXPANSION JOINTS, WITH 24 INCH SMOOTH BAR DOWELS CENTERED ON EXPANSION JOINTS WITH BAR TO BAR SPACING MATCHING THAT OF THE ADJACENT STRUCTURAL STEEL. PREFORMED EXPANSION JOINT MATERIAL SHALL BE PLACED BETWEEN ADJACENT CONCRETE PLACEMENTS TO WITHIN $\frac{1}{2}$ INCH OF THE SURFACE. CONTROL AND EXPANSION JOINTING PLANS AND PATTERNS FOR LARGE AREA CONCRETE PLACEMENTS SHALL BE APPROVED BY THE ENGINEER.
- 11) RIPRAP AND LANDSCAPE BOULDERS SHALL BE SOUND, ANGULAR ROCK OF THE DIMENSIONS INDICATED. IT IS LIKELY THAT RIPRAP AND LANDSCAPE BOULDERS CAN BE OBTAINED FROM SITE BEDROCK EXCAVATIONS, AS APPROVED BY THE ENGINEER.
- 12) SUBGRADE STABILIZATION, IF REQUIRED, TYPICALLY CONSISTS OF A COMBINATION OF MUCK EXCAVATION, CLASS 2 OR 6 AGGREGATE BASE COURSE, AND GEGRID REINFORCEMENT. THE NEED, METHOD, AND QUANTITY FOR SUBGRADE STABILIZATION WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
- 13) THE PHYSICAL FEATURES WITHIN THE LIMITS OF THE PROJECT HAVE BEEN SHOWN BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN. THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL FEATURES PRIOR TO BEGINNING ANY WORK.
- 14) THE CONTRACTOR SHALL KEEP ALL OPERATIONS WITHIN THE PROJECT LIMITS AS ESTABLISHED BY THE OWNER. THE CONTRACTOR SHALL KEEP EQUIPMENT AND MATERIALS WITHIN THESE LIMITS AND CLEAR OF THE PUBLIC ROADWAYS. CONSTRUCTION ACTIVITIES, STAGING, PARKING, OR OFF-SITE DISPOSAL SHALL NOT ENCROACH UPON PRIVATE OR PUBLIC LANDS WITHOUT WRITTEN APPROVAL FROM THE PROPERTY OWNER OR LAND MANAGEMENT AGENCY.
- 15) SHOULD ANY QUESTIONS ARISE OR ANY DISCREPANCIES BE NOTED IN THE PLANS, THE ENGINEER SHOULD BE CONSULTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEMS.
- 16) THE CONTRACTOR SHALL PROTECT ALL EXISTING SURVEY MONUMENTS FROM DAMAGE DURING CONSTRUCTION OPERATIONS. ANY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE RESET AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR AND THE ENGINEER SHALL NOTE THESE MONUMENTS IN THE FIELD PRIOR TO CONSTRUCTION.
- 17) ANY DAMAGE TO PUBLIC ROADWAYS SHALL BE REPAIRED IMMEDIATELY AND PRIOR TO CONTINUING OPERATIONS. DUST SHALL BE PROPERLY CONTROLLED, AND ANY MUD OR OTHER MATERIAL TRACKED OR OTHERWISE DEPOSITED ON THE ROADWAY SHALL BE REMOVED DAILY OR AS ORDERED BY THE ENGINEER.
- 18) ANY PAVEMENT, CURB AND GUTTER, OR SIDEWALK MATERIAL THAT IS DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATION, AND IS NOT DESIGNATED FOR REMOVAL, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- 19) THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FENCING, FLAGGERS, OR OTHER DEVICES NECESSARY TO MAINTAIN A SAFE SITE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL GUIDELINES AND STANDARDS. TRAFFIC SIGNS MAY BE REMOVED FOR THE CONVENIENCE OF THE CONTRACTOR, BUT AT NO TIME SHALL AN INTERSECTION BE LEFT IN AN UNSAFE CONFIGURATION. TEMPORARY STOP SIGNS, ETC. SHALL BE INSTALLED BY THE CONTRACTOR WHEN SUCH SIGNS ARE TO BE REMOVED FOR ANY EXTENDED PERIOD OF TIME. ANY EXISTING SIGNS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- 20) PAVEMENT MARKING AND SIGNS SHALL BE CONSTRUCTED WITH APPROPRIATE AND DURABLE MATERIALS IN CONFORMANCE WITH THE MUTCD, AND CDOT STANDARDS, AS APPROPRIATE. SIGNS SHALL BE CLASS 1, WITH THE PLACARDS AS INDICATED.
- 21) SEE ARCHITECT PLANS FOR LANDSCAPE AND FENCING DETAILS ASSOCIATED WITH THE SITE IMPROVEMENTS.
- 22) ADD 7500 FEET TO SPOT ELEVATIONS TO MATCH SURVEY ELEVATION DATUM.

- SHOWN ON THE PLANS ARE PLOTTED FOR SCHEMATIC INFORMATION AND SURFACE EVIDENCE AVAILABLE AT THE TIME OF DESIGN. THE INFORMATION SHOWN ON THESE PLANS CONCERNING TYPE AND LOCATION OF UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. SOME UTILITIES MAY HAVE BEEN ADDED OR RELOCATED PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LOCATIONS OF EXISTING STRUCTURES AND UTILITIES SHOWN ON THE DRAWINGS AND ASCERTAIN WHETHER ANY OTHER STRUCTURE AND UTILITIES MAY EXIST. EVERY REASONABLE MEANS SHALL BE USED, INCLUDING FIELD LOCATION OF THE UTILITY USING WHATEVER PROSPECTING MEANS ARE NECESSARY. THE CONTRACTOR ASSUMES RESPONSIBILITY FOR THE PROTECTION OF ALL UTILITIES DURING THE WORK, AND SHALL HOLD THE OWNER AND THEIR CONSULTANTS HARMLESS FOR ANY AND ALL DAMAGES TO UTILITIES ARISING FROM CONSTRUCTION OPERATIONS.
- 2) A MEETING WILL BE HELD WITH UTILITY PROVIDERS PRIOR TO PREPARATION OF CONSTRUCTION DOCUMENTS TO VERIFY CONNECTION POINTS AND CONFIGURATIONS. SERVICE CONNECTION LOCATIONS AND ALL UTILITY WORK SHALL BE FULLY COORDINATED WITH THE RESPECTIVE PROVIDER, AS APPROPRIATE.
- 3) THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITIES AT LEAST TWO (2) BUSINESS DAYS, NOT INCLUDING THE ACTUAL DAY OF NOTICE, PRIOR TO COMMENCING SUCH OPERATIONS. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT 811 OR 1-800-922-1987, TO HAVE LOCATIONS OF UNCC REGISTERED LINES MARKED BY MEMBER COMPANIES. ALL OTHER UNDERGROUND FACILITIES SHALL BE LOCATED BY CONTACTING THE RESPECTIVE OWNER. UTILITY SERVICE LATERALS SHALL ALSO BE LOCATED PRIOR TO BEGINNING EXCAVATION OR GRADING.
- 4) THE CONTRACTOR SHALL VERIFY AND DOCUMENT THE CONDITION OF EXISTING UTILITIES (VISIBLE FACILITIES) WITH REPRESENTATIVES FROM THE UTILITY COMPANIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- 5) BEDROCK IS LOCATED VERY CLOSE TO THE GROUND SURFACE, AND IT IS LIKELY THAT ROCK BLASTING OR HAMMERING WILL BE REQUIRED FOR MUCH OF THE UTILITY INSTALLATION.
- 6) ALL WATER AND SEWER INFRASTRUCTURE SHALL BE CONSTRUCTED IN CONFORMANCE WITH PAGOSA AREA WATER AND SANITATION DISTRICT (PAWSD) TECHNICAL SPECIFICATIONS IN EFFECT AT THE TIME WORK IS INITIATED. ALL SIGNIFICANT BENDS SHOWN FOR RIGID WATER PIPE OR SEWER LINES SHALL BE ACCOMPLISHED WITH STANDARD FITTINGS, OR A COMBINATION OF STANDARD FITTINGS. IN TIGHT AREAS AND WHERE MULTIPLE FITTINGS OR FIXTURES MAY BE REQUIRED, FLANGED CONNECTIONS MAY BE APPROPRIATE. SMALL VARIANCES FROM STANDARD FITTING ANGLES SHALL BE TAKEN UP IN PIPE AND JOINT DEFLECTION, OR CURVED SECTIONS OF PIPE, AS ALLOWED BY THE MANUFACTURER.
- 7) A 2" DIAMETER POLYETHYLENE WATER SERVICE HAS BEEN SPECIFIED, WITH ASSOCIATED AND PROPERLY SIZED CURB STOP AND WATER METER AS REQUIRED BY PAWSD STANDARDS. THE METER AND SERVICE CONNECTION IS TYPICALLY PERFORMED BY PAWSD WITH ASSISTANCE FROM THE SITE CONTRACTOR. SIZE OF THE WATER SERVICE SHALL BE VERIFIED WITH THE PROJECT MEP ENGINEER PRIOR TO INSTALLATION.
- 8) THERE SHALL BE A 6" DIAMETER SDR 35 PVC GRAVITY SEWER COLLECTION SYSTEM INTERNAL TO THE SITE WHICH WILL DRAIN TO AN E-ONE WH484 GRINDER PUMP LIFT STATION, WHICH WILL THEN CONNECT TO THE HARMAN PARK PRESSURE SEWER SYSTEM. THE CONTRACTOR SHALL VERIFY THAT A PROPER CONNECTION KIT EXISTS AT THE SERVICE CONNECTION LOCATION, AND PROVIDE ONE IF NOT PRESENT. THE LIFT STATION AND ASSOCIATED PRESSURE SEWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND PAWSD STANDARDS, AS APPLICABLE. FILL SHALL BE PLACED AROUND THE LIFT STATION TO PROVIDE AN AESTHETICALLY PLEASING INSTALLATION, WITH POSITIVE DRAINAGE AWAY FROM THE STRUCTURE IN ALL DIRECTIONS. WHERE INCREASERS ARE REQUIRED TRANSITIONING FROM BUILDING TO SITE PIPING, ECCENTRIC FITTINGS SHALL BE USED TO MAINTAIN FLOWLINES AND PLANNED SLOPES.
- 9) CONNECTION TO THE EXISTING WATER MAIN ON THE NORTH SIDE OF HARMAN PARK DRIVE IS PLANNED WITH A LIVE TAP FOR THE SUBJECT PROJECT FIRE WATER, BY MEANS OF A 6" DIAMETER LIVE TAP, AN THEN INCREASING TO 8" DIAMETER AWWA C900 CLASS 200 PVC PIPE FOR THE LINE EXTENDING TO THE "T" AND THEN TO THE FIRE HYDRANT ON THE WEST SIDE OF THE DRIVEWAY. THE LINE WHICH CONTINUES TOWARDS THE BUILDING CAN BE REDUCED TO 6" DIAMETER AWWA C900 CLASS 200 PVC. CONNECTION TO THIS LINE SHALL BE FULLY COORDINATED WITH PAWSD, AS PREVIOUSLY INDICATED.
- 10) THE GAS, ELECTRIC, TELEPHONE STUB-OUTS FOR THE PROPERTY AND POTENTIAL SERVICE ROUTES ARE SHOWN ON THE PLAN. THESE CONNECTIONS SHOULD BE VERIFIED WITH EACH OF THE RESPECTIVE UTILITY PROVIDERS, AS EACH DOES THEIR OWN DESIGN. TIE-IN LOCATIONS AND ALIGNMENTS MAY CHANGE FOLLOWING MEETING WITH THE UTILITY PROVIDERS, AS PREVIOUSLY MENTIONED.
- 11) ALL CLEAN-OUT, VALVE BOX, MANHOLES, OR OTHER UTILITY ACCESS APPURTENANCES SHALL BE PROPERLY ADJUSTED TO FINAL GRADE. IN HARD-SCAPE AREAS, THEY SHALL BE 1/8 INCH BELOW FINISHED GRADE TO AVOID TRIPPING OR SNOW PLOW HAZARDS.
- 12) IN AREAS WHERE FROST PROTECTION IS NOT AVAILABLE DUE TO SHALLOW DEPTH, INSULATION MAY NEED TO BE PLACED TO PROTECT STRUCTURES SUSCEPTIBLE TO FREEZING DAMAGE. NO SUCH UTILITIES SHALL BE LEFT IN A CONFIGURATION WHERE FREEZING IS A CONCERN.

4' MIN., VARIES

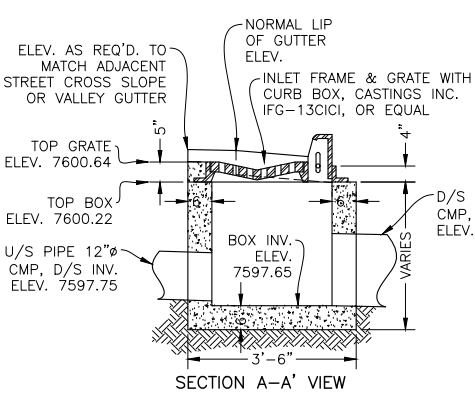
4H:1V SIDE SLOPES

GEOTEXTILE FILTER FABRIC, MIRAFI 140N OR EQUAL

RIPRAP SWALE DETAIL
(4:1 SIDE SLOPES)
SCALE: 1" = 1'

RIPRAP THICK BE 1.75 x 6" SIZE (6" SHOWN WITH THICKNESS)

- 1) REINFORCE CONCRETE BOX WITH NO. 4 REBAR AT 12" O.C. BOTH DIRECTIONS AND PLACE #4 CLOSED HOOP AROUND PIPE PENETRATIONS. OUTSIDE FOOTPRINT 42"x52", WITH ALL WALLS 6" THICK. SEE LAYOUT DATA FOR ELEVATIONS AND RESULTING BOX HEIGHTS.
- 2) EXTEND LONGITUDINAL BARS IN GUTTER AROUND FRAME WITH 1" CLEARANCE.
- 3) SEAL ALL PIPE PENETRATIONS AND IMPERFECTIONS WITH NON-SHRINK GROUT.
- 4) TRIM PIPE IN BOXES AS NECESSARY SO FLOWS ARE NOT IMPEDED.
- 5) SEE LAYOUT DATA FOR SPECIFIC ELEVATIONS AND COORDINATES. CARE SHOULD BE TAKEN IN CONSTRUCTING CONCRETE BOXES TO THE PROPER ELEVATIONS AND LOCATIONS TO ENSURE PROPER PIPE AND SURFACE DRAINAGE AND FRAME AND GRATE POSITIONING WITHIN CURB AND GUTTER.
- 6) PIPES SHALL BE POSITIONED SUCH THAT PIPE CENTERLINE IS AT THE MIDDLE OF THE INSIDE BOX WALL.
- 7) WHERE BASINS ARE LOCATED IN VALLEY GUTTER, ADJUST VALLEY GUTTER CONCRETE DIMENSIONS IN VICINITY OF BOX AS NECESSARY TO COMPLETELY COVER BOX FOOTPRINT.



SCALE: $1/2" = 1'$

6'

6"

6-#3 REBAR LONGITUDINALLY THROUGH VALLEY GUTTER TIED TRANSVERSELY W/#3 REBAR AT 24" O.C.

DRESS FINISHED GRADE TO TOP OF WALK OR CURB AND SLOPE (3:1 OR FLATTER) AS REQ'D.

6", TYP.

4" THICK CONCRETE SIDEWALK

-2%, MAX.

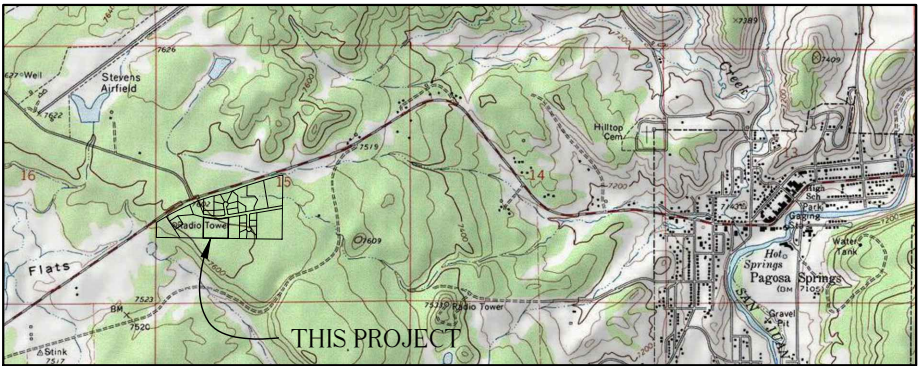
VARIES, 5' SHOW

4" COMPACTED CLASS 6 ABC

6x6 10/10 WWM OR #3 REBAR @ 18" O.C. (MESH SHOWN)

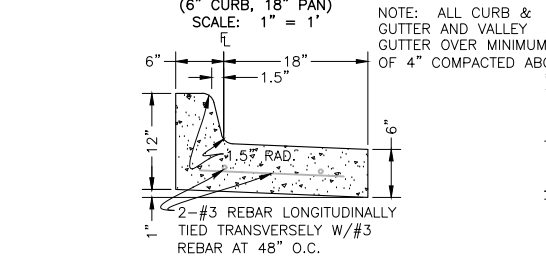
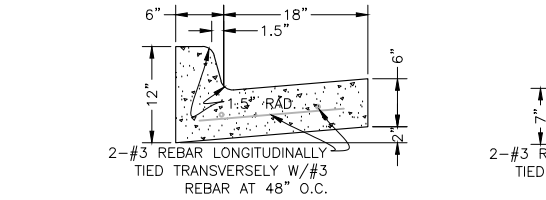
SCARIFIED & RECOMPACTED SUBGRADE, MIN. 6" IN ALL HARDSCAPE AREAS

SIDEWALK, CURB & PARK
SCALE: 1,

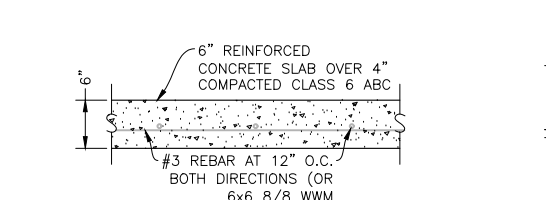




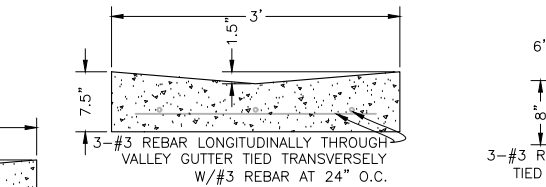
VICINITY MAP
 SCALE: 1" = 2,000'



SPILL CURB AND GUTTER DETAIL SPILL
(6" CURB, 18" PAN)
SCALE: 1" = 1'

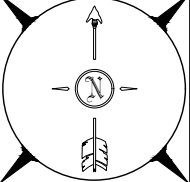


CONCRETE APRON DETAIL
(CONCRETE AREAS N. & S. OF BLDG.)
SCALE: 1" = 1'



TYPICAL VALLEY GUTTER DETAIL **CA**
(3' WIDE, 1.5" VALLEY)
SCALE: 1" = 1'

- TYPICAL DETAIL**
-
- THICK EXPANSION
OF MATERIAL BETWEEN
3 AND ADJACENT
CONCRETE TO WITHIN 1/2" SURFACE
- 2' - 2' - 4" HMA (2 LIFTS)
- SAWCUT, REMOVE AND REPLACE 2' PATCH, WHERE REQUIRED
- SAME STRUCTURAL SECTION FOR DRIVES AND PARKING LOTS, SEE NOTE 4
- 6" (MIN.) COMPACTED CLASS 6 ABC UNDER ASPHALT
- B & GUTTER REQ'D. OVER CL. 6 ABC
- 1) THE INDIVIDUAL TRUNCATED DOME INSERTS SHALL BE 2' LONG WITH THE WIDTH TO WITHIN 6" OF THE EDGE OF EACH SIDE OF THE RAMP WIDTH, INSTALLED IN THE LOCATIONS INDICATED. INSERTS SHALL BE PATINA FINISH CAST IRON, OR OTHER MATERIAL AND COLOR (AS DETERMINED BY THE ARCHITECT) APPROPRIATE FOR THE INTENDED USE AND AS APPROVED BY THE OWNER.
 - 2) TRUNCATED DOME INSERTS MAY BE INSTALLED AGAINST THE BACK OF CURB WHERE FLUSH FOR THE ENTIRE LENGTH, OTHERWISE, SHALL HAVE A MINIMUM OF 2" AND MAXIMUM OF 6" BETWEEN THE INSERT AND THE BACK OF CURB. INSERTS SHALL BE INSTALLED TO ALIGN WITH THE WALKWAYS, NOT NECESSARILY THE CURBS.
 - 3) DRIVEWAY APRONS ALONG ACCESSIBLE SIDEWALK ROUTES SHALL HAVE A MAXIMUM 2% CROSS SLOPE ALONG THE SIDEWALK PATH. ALL DRIVEWAY APRONS SHALL HAVE CONCRETE AND GRAVEL THICKNESS AS SHOWN IN THE CONCRETE APRON DETAIL.
 - 4) ANY ASPHALT PATCHES REQUIRED IN PUBLIC STREETS SHALL BE A MINIMUM OF 3" OF ASPHALT OVER 9" OF CLASS 6 ABC OVER RECOMPACTED SUBGRADE. IF THE EXISTING STRUCTURE IS GREATER THAN THE INDICATED MINIMUM, THE PATCH SHALL MATCH THE EXISTING STRUCTURE.



DAVIS ENGINEERING SERVICE, INC.

DAVIS ENGINEERING SERVICE, INC.
188 S. 9th STREET - P.O. BOX 12
PAGOSA SPRINGS, COLORADO
81349
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DAVIS

ELEVATION BASE ASSUMED

0" 1" 2" 3"

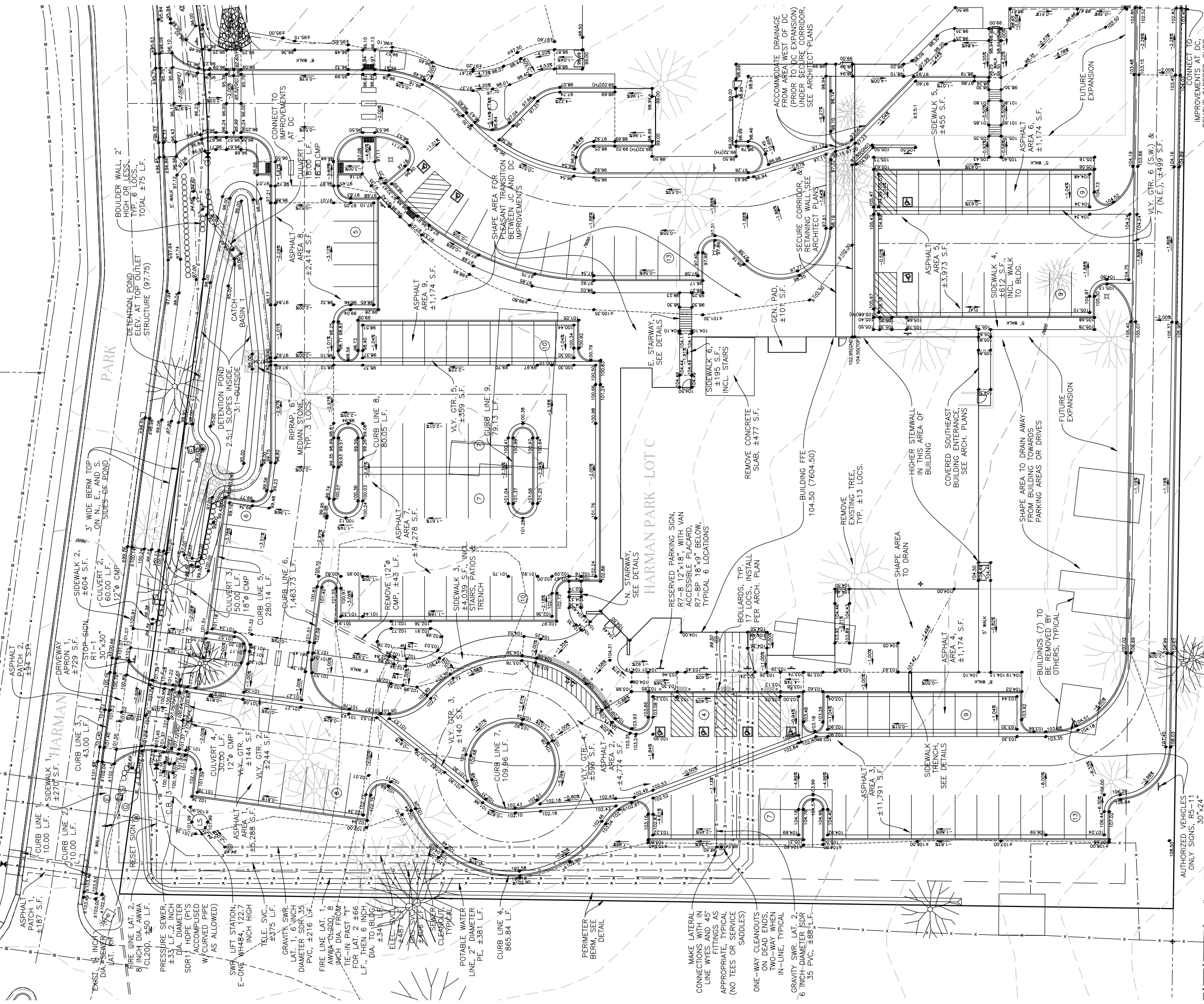
Reynolds, Ash & Associates P.O. Box 96 Pagosa Springs, CO 81447 P07789 Sheet C1	REVISIONS NO. DATE REVISIONS 1 11/1/83 1.1 2 11/1/83 1.2 3 11/1/83 1.3 4 11/1/83 1.4 5 11/1/83 1.5 6 11/1/83 1.6 7 11/1/83 1.7 8 11/1/83 1.8 9 11/1/83 1.9 10 11/1/83 1.10 11 11/1/83 1.11 12 11/1/83 1.12 13 11/1/83 1.13 14 11/1/83 1.14 15 11/1/83 1.15 16 11/1/83 1.16 17 11/1/83 1.17 18 11/1/83 1.18 19 11/1/83 1.19 20 11/1/83 1.20 21 11/1/83 1.21 22 11/1/83 1.22 23 11/1/83 1.23 24 11/1/83 1.24 25 11/1/83 1.25 26 11/1/83 1.26 27 11/1/83 1.27 28 11/1/83 1.28 29 11/1/83 1.29 30 11/1/83 1.30 31 11/1/83 1.31 32 11/1/83 1.32 33 11/1/83 1.33 34 11/1/83 1.34 35 11/1/83 1.35 36 11/1/83 1.36 37 11/1/83 1.37 38 11/1/83 1.38 39 11/1/83 1.39 40 11/1/83 1.40 41 11/1/83 1.41 42 11/1/83 1.42 43 11/1/83 1.43 44 11/1/83 1.44 45 11/1/83 1.45 46 11/1/83 1.46 47 11/1/83 1.47 48 11/1/83 1.48 49 11/1/83 1.49 50 11/1/83 1.50 51 11/1/83 1.51 52 11/1/83 1.52 53 11/1/83 1.53 54 11/1/83 1.54 55 11/1/83 1.55 56 11/1/83 1.56 57 11/1/83 1.57 58 11/1/83 1.58 59 11/1/83 1.59 60 11/1/83 1.60 61 11/1/83 1.61 62 11/1/83 1.62 63 11/1/83 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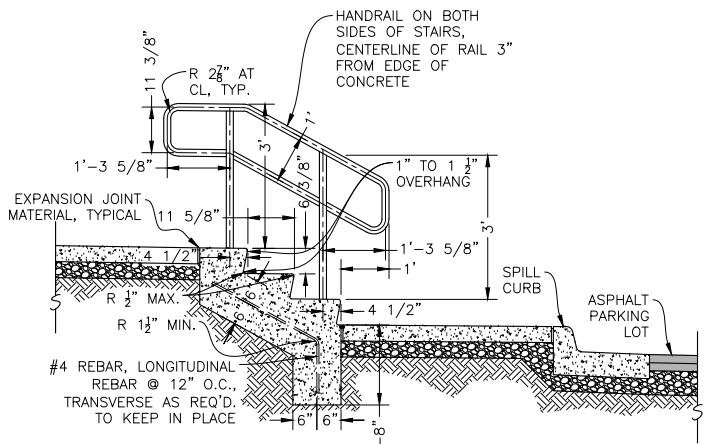
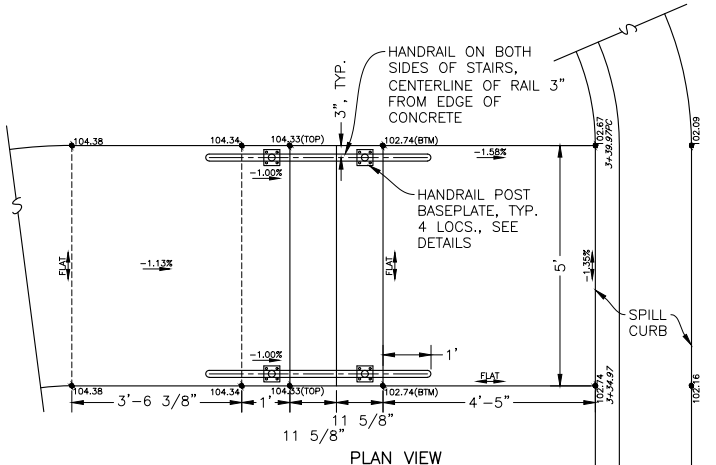
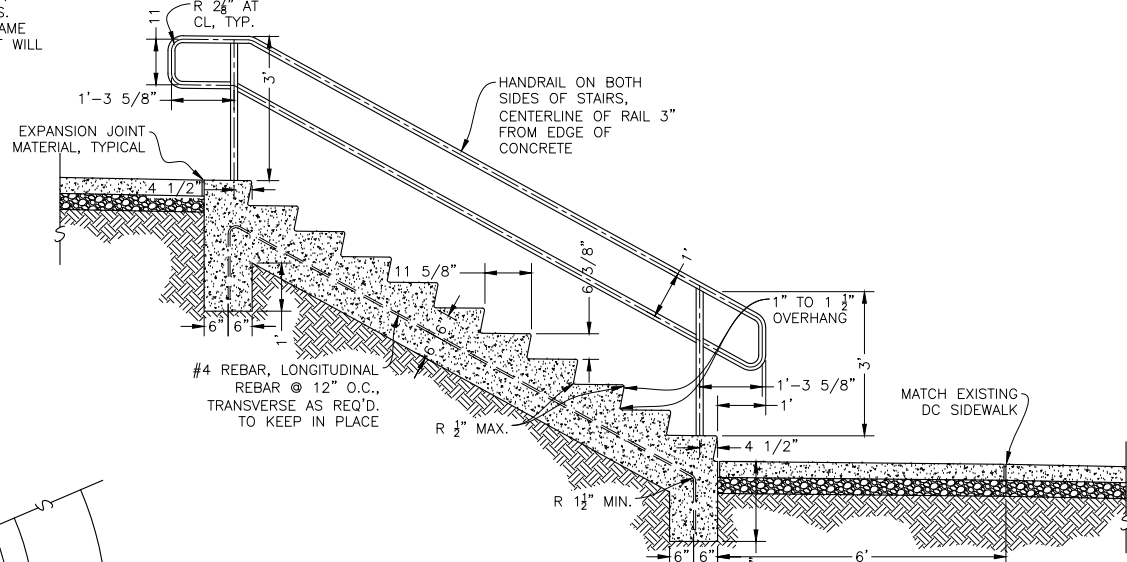
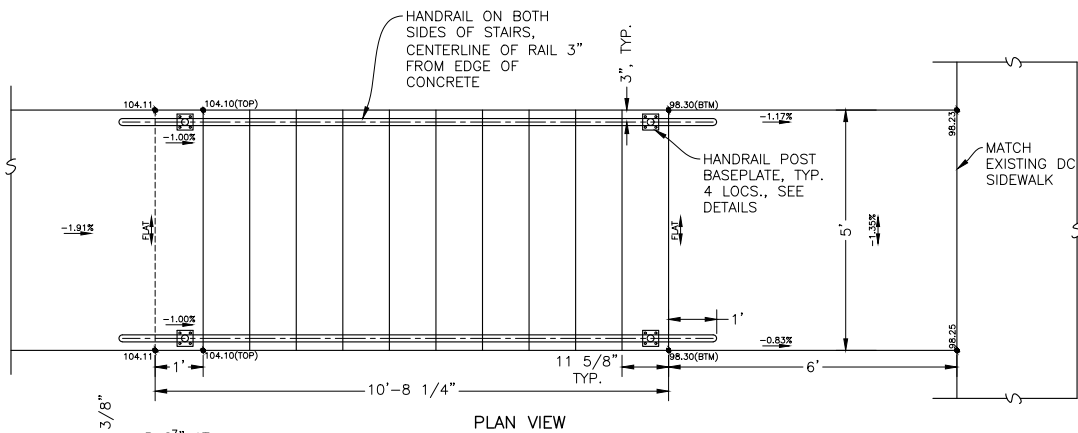
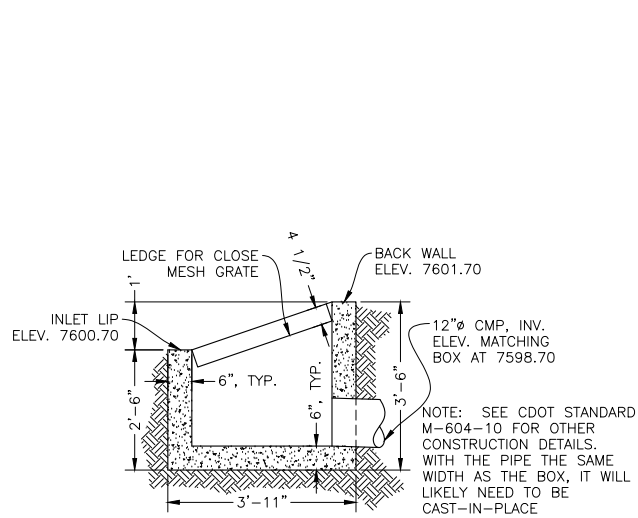
--- 7942 ---	Existing contour, one foot interval	--- E --- E ---	Proposed buried electric line	ⓔ	Existing electric meter or appurt.
---	Existing edge asphalt road or drive	--- X --- X ---	Existing fence	ⓑ	Existing telephone pedestal
---	Proposed edge asphalt or saw-cut line	---	Proposed significant grade break	ⓐ	Existing cable television pedestal
---	Existing edge gravel or dirt road or drive	---	Proposed drainage	ⓓ	Existing fire hydrant
---	Existing easement line	---	Proposed foundation drain	Ⓢ	Proposed fire hydrant
---	Existing property line interior or adjacent	---	Proposed reference line w/stationing	Ⓣ	Proposed water gate valve
---	Existing property line setbacks	---	Proposed curb & gutter	Ⓥ	Existing or proposed sign
---	Existing exterior property line subject parcel	---	Existing culvert	Ⓦ	Existing parking lot light
---	Existing pressure sewer line	---	Proposed culvert w/end sections	Ⓧ	Proposed parking lot light
---	Proposed pressure sewer line	---	Proposed riprap	Ⓨ	Proposed street light
---	Existing water line	---	Proposed boulder wall	Ⓩ	Survey control point
---	Proposed water line	---	Proposed catch basin	ⓛ	Radius point
---	Existing gas line	---	Proposed truncated dome insert	Ⓜ	Proposed finished grade spot elevation
---	Proposed gas line	---	Existing water meter or appurt.	Ⓨ	Proposed invert or flow line spot elevation
---	Existing telephone line	---	Proposed sewer cleanout	Ⓩ	Proposed finished grade slope
---	Proposed telephone line	---	Proposed sewer lift station	ⓐ	Proposed invert or flow line slope
---	Existing buried electric line	---	Existing sewer manhole	ⓑ	Note: Add 7500 feet to spot elevations to match survey datum
---	Existing buried electric line	---	Existing sewer stub or appurt.	ⓓ	

NOTE: POWER SUPPLY TO THE LIFT STATION SHALL BE SUCH THAT EMERGENCY POWER IS AVAILABLE FROM GENERATOR.

4-1/2" TAP
TIE-IN TO
WATER
TO GAS

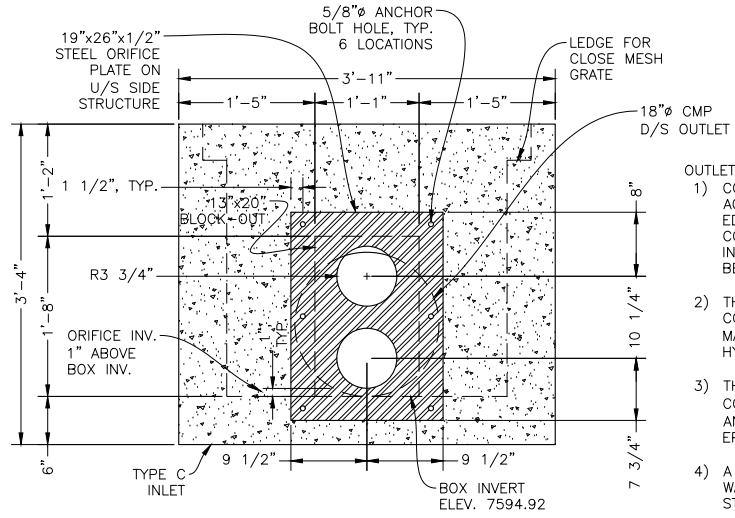
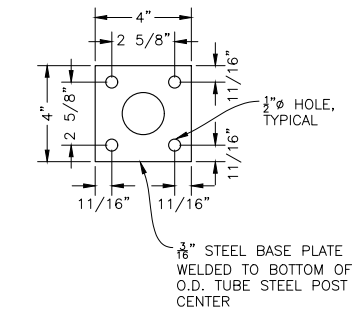
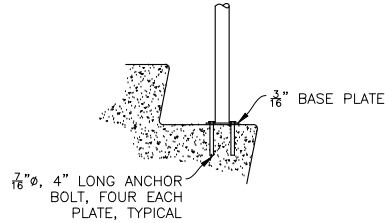


Reynolds, Ash & Associates		DAVIS ENGINEERING SERVICE, INC.	
P.O. Box 96 Pagosa Springs, CO 81447		DAVIS ENGINEERING SERVICE, INC. 18 S. 9th STREET - P.O. BOX 108 PAGOSA SPRINGS, COLORADO 81447 PHONE (970) 244-4345 FAX (970) 244-4310	
Archuleta County Justice Center		1" = 20' 2" = 3" ELEVATION BASE ASSUMED	
Grading, Drainage, and Utility Plan		DATE: 06/18/20	
P07789		SHEET 22	

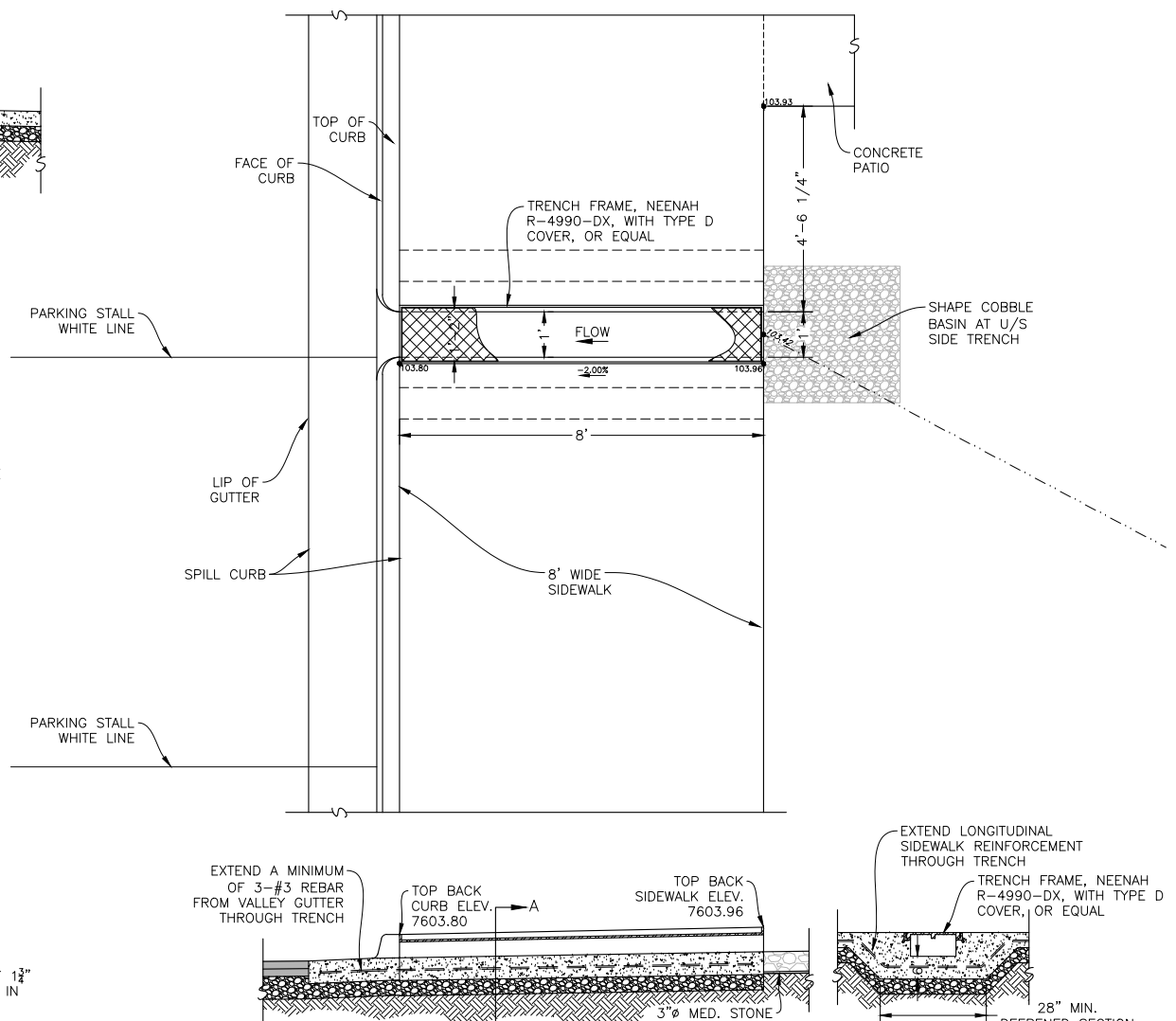


NORTH STAIR & HANDRAIL DETAILS
SCALE: 1/2" = 1'

- STAIR AND HANDRAIL NOTES:**
- 1) STAIRS SHALL BE CONSTRUCTED OVER COMPACTED NATIVE OR IMPORTED MATERIAL.
 - 2) TREADS SHALL HAVE SLIGHT SLOPE FOR DRAINAGE, BUT NOT MORE THAN 2% (SHOWN AT 1%).
 - 3) PREFORMED EXPANSION JOINT MATERIAL 1/2" THICK TO WITHIN 1/2" OF THE SURFACE SHALL BE PLACED BETWEEN STAIR AND SIDEWALK ELEMENTS.
 - 4) MATERIAL FOR HANDRAILS SHALL BE COR-TEN WEATHERING STEEL ROUND TUBING WITH 1 1/2" O.D. (OR CLOSEST STANDARD SIZE, AS APPROVED BY THE ENGINEER).
 - 5) HANDRAIL SHALL BE ATTACHED TO THE CONCRETE STAIRS WITH FOUR ANCHOR BOLTS AT EACH POST. MECHANICAL ANCHORING SYSTEM, SUCH AS HILTI KWIK BOLT 3, OR EQUAL IS ALSO ACCEPTABLE FOR USE. ALTERNATE METHODS OF ATTACHMENT SUCH AS PLACING A WELD PLATE DURING CONCRETE PLACEMENT MAY BE CONSIDERED UPON SUBMITTAL BY THE CONTRACTOR TO THE ENGINEER.
 - 6) WELDS SHALL BE APPROPRIATE FOR THE MEMBER THICKNESS AND CONFIGURATION.
 - 7) ALL SURFACES SHALL HAVE A UNIFORM APPEARANCE, BE SMOOTH TO THE TOUCH, AND ALL CORNERS SHALL BE ROUNDED.



- OUTLET STRUCTURE NOTES:**
- 1) CONCRETE OUTLET STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH CDOT STANDARD M-604-10, LATEST EDITION, WITH A CLOSE MESH GRATE. IT SHALL BE CONSTRUCTED TO THE DIMENSIONS INDICATED AND INCORPORATE A BLOCK-OUT UPSTREAM SIDE WHICH WILL BE COVERED BY THE ORIFICE PLATE.
 - 2) THE STEEL ORIFICE PLATE SHALL BE PROTECTED FROM CORROSION BY POWDER COATING OR PAINTING WITH MARINE GRADE PAINT, SUCH AS 15 MILS (MIN.) OF HYCOTE 151, OR SIMILAR.
 - 3) THE STEEL ORIFICE PLATE SHALL BE ATTACHED TO THE CONCRETE BOX WITH 1/2 inch diameter, 4 inch long, GALVANIZED ANCHOR BOLTS (SIX MIN.), EITHER MECHANICALLY OR EPOXY SECURED.
 - 4) A GASKET, O-RING, OR BEAD OF APPROPRIATE WATER-TIGHT SEALANT SHALL BE PLACED BETWEEN THE STEEL ORIFICE PLATE AND THE CONCRETE BOX.



DAVIS ENGINEERING SERVICE, INC.

18 S. 9th STREET - P.O. BOX 1208
PAGOSA SPRINGS, COLORADO 81447
PHONE (970) 244-2305
FAX (970) 244-2310

AS NOTED
DATE: 06/18/20

NO.	REVISION	DATE	BY	CHKD	APP'D
1					
2					
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Reynolds, Ash & Associates
P.O. Box 96
Pagosa Springs, CO 81447

Archuleta County
Justice Center
Construction Details

P07789
Sheet C3

Appendix B

NOAA Site Specific Precipitation Estimate



NOAA Atlas 14, Volume 8, Version 2
Location name: Pagosa Springs, Colorado,
USA*

Latitude: 37.2661°, Longitude: -107.0512°

Elevation: 7607.46 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

PF tabular

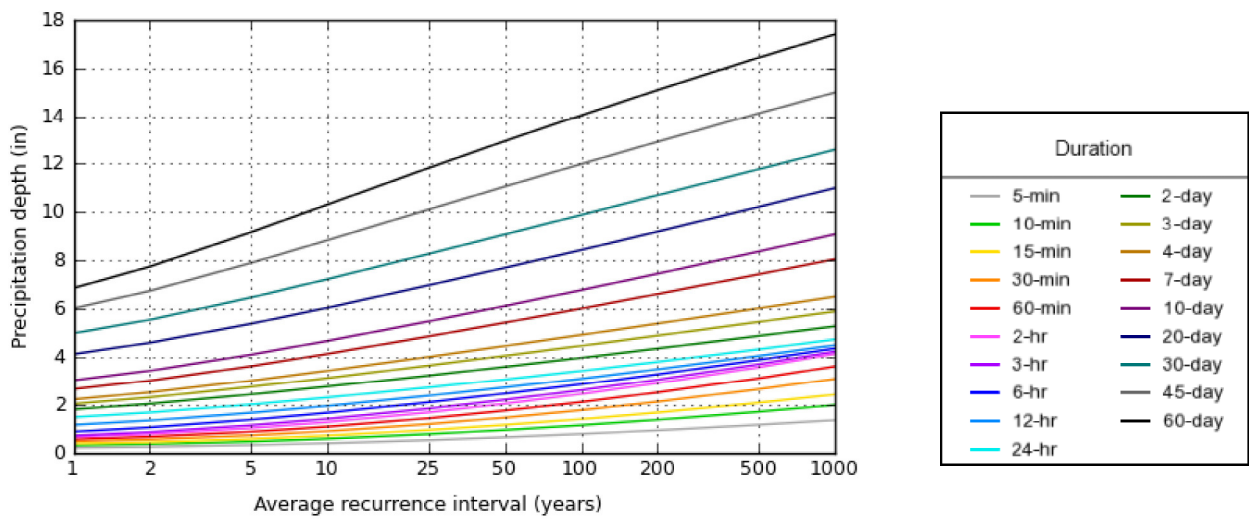
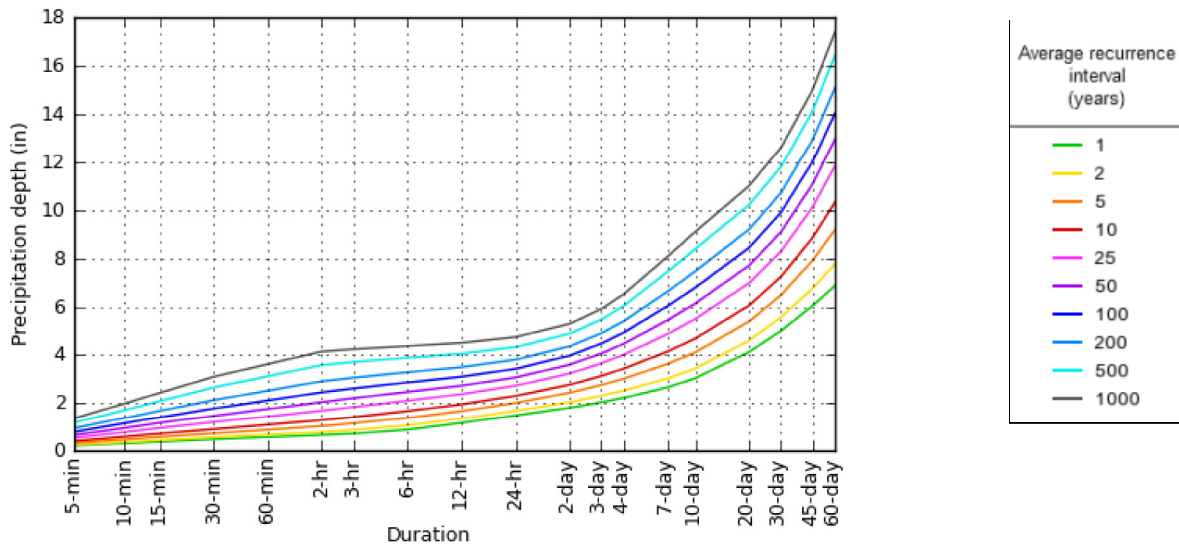
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.215 (0.169–0.276)	0.251 (0.197–0.322)	0.326 (0.254–0.418)	0.404 (0.313–0.520)	0.534 (0.413–0.733)	0.653 (0.489–0.895)	0.788 (0.569–1.10)	0.942 (0.653–1.33)	1.17 (0.779–1.68)	1.36 (0.875–1.94)
10-min	0.315 (0.247–0.404)	0.367 (0.288–0.471)	0.477 (0.372–0.612)	0.591 (0.459–0.761)	0.782 (0.605–1.07)	0.956 (0.715–1.31)	1.15 (0.833–1.60)	1.38 (0.956–1.95)	1.71 (1.14–2.46)	1.99 (1.28–2.85)
15-min	0.385 (0.302–0.493)	0.448 (0.351–0.574)	0.582 (0.454–0.747)	0.721 (0.560–0.928)	0.954 (0.738–1.31)	1.17 (0.872–1.60)	1.41 (1.02–1.96)	1.68 (1.17–2.38)	2.09 (1.39–3.00)	2.43 (1.56–3.47)
30-min	0.487 (0.381–0.623)	0.564 (0.442–0.723)	0.730 (0.570–0.937)	0.905 (0.702–1.17)	1.20 (0.930–1.65)	1.47 (1.10–2.02)	1.78 (1.29–2.48)	2.13 (1.48–3.02)	2.66 (1.77–3.82)	3.10 (1.99–4.42)
60-min	0.575 (0.451–0.736)	0.675 (0.529–0.865)	0.882 (0.689–1.13)	1.09 (0.849–1.41)	1.44 (1.12–1.98)	1.76 (1.32–2.41)	2.12 (1.53–2.94)	2.52 (1.75–3.56)	3.12 (2.08–4.48)	3.62 (2.33–5.17)
2-hr	0.663 (0.527–0.836)	0.787 (0.624–0.993)	1.03 (0.818–1.31)	1.28 (1.01–1.63)	1.69 (1.32–2.27)	2.05 (1.55–2.76)	2.46 (1.80–3.35)	2.91 (2.05–4.04)	3.59 (2.42–5.06)	4.15 (2.71–5.83)
3-hr	0.717 (0.547–0.896)	0.868 (0.694–1.09)	1.15 (0.917–1.44)	1.42 (1.13–1.79)	1.85 (1.44–2.44)	2.21 (1.68–2.93)	2.62 (1.92–3.52)	3.06 (2.16–4.19)	3.71 (2.52–5.17)	4.24 (2.79–5.90)
6-hr	0.885 (0.717–1.09)	1.06 (0.861–1.31)	1.38 (1.12–1.71)	1.67 (1.34–2.07)	2.11 (1.66–2.71)	2.47 (1.90–3.20)	2.87 (2.13–3.77)	3.29 (2.35–4.40)	3.89 (2.68–5.31)	4.37 (2.92–5.99)
12-hr	1.17 (0.957–1.41)	1.35 (1.11–1.64)	1.67 (1.37–2.03)	1.96 (1.59–2.38)	2.38 (1.89–3.00)	2.73 (2.12–3.46)	3.10 (2.34–4.00)	3.50 (2.54–4.60)	4.06 (2.84–5.44)	4.51 (3.06–6.07)
24-hr	1.49 (1.24–1.78)	1.68 (1.40–2.01)	2.02 (1.67–2.41)	2.31 (1.90–2.77)	2.73 (2.19–3.37)	3.07 (2.42–3.82)	3.43 (2.62–4.34)	3.81 (2.80–4.91)	4.33 (3.07–5.69)	4.75 (3.28–6.29)
2-day	1.81 (1.53–2.12)	2.05 (1.72–2.40)	2.44 (2.05–2.87)	2.77 (2.31–3.26)	3.24 (2.63–3.90)	3.60 (2.87–4.39)	3.98 (3.07–4.93)	4.36 (3.25–5.51)	4.89 (3.51–6.30)	5.29 (3.71–6.89)
3-day	2.04 (1.74–2.37)	2.31 (1.96–2.69)	2.76 (2.34–3.21)	3.13 (2.64–3.66)	3.66 (2.99–4.36)	4.06 (3.26–4.89)	4.48 (3.49–5.49)	4.90 (3.68–6.12)	5.47 (3.97–6.97)	5.90 (4.19–7.61)
4-day	2.23 (1.91–2.57)	2.53 (2.16–2.92)	3.02 (2.57–3.49)	3.44 (2.91–3.98)	4.02 (3.31–4.76)	4.47 (3.61–5.35)	4.93 (3.86–6.00)	5.40 (4.08–6.70)	6.03 (4.41–7.63)	6.51 (4.65–8.34)
7-day	2.66 (2.30–3.03)	3.03 (2.61–3.44)	3.63 (3.13–4.14)	4.14 (3.55–4.74)	4.87 (4.06–5.70)	5.44 (4.44–6.42)	6.02 (4.78–7.23)	6.62 (5.07–8.11)	7.43 (5.51–9.29)	8.06 (5.84–10.2)
10-day	3.04 (2.65–3.43)	3.44 (2.99–3.88)	4.11 (3.56–4.64)	4.68 (4.04–5.30)	5.49 (4.61–6.37)	6.13 (5.05–7.17)	6.78 (5.43–8.08)	7.46 (5.77–9.06)	8.38 (6.26–10.4)	9.09 (6.64–11.4)
20-day	4.13 (3.65–4.58)	4.61 (4.06–5.10)	5.39 (4.74–5.98)	6.05 (5.30–6.74)	6.98 (5.95–7.94)	7.70 (6.44–8.85)	8.44 (6.86–9.87)	9.20 (7.23–11.0)	10.2 (7.77–12.4)	11.0 (8.18–13.5)
30-day	5.00 (4.45–5.48)	5.56 (4.94–6.10)	6.47 (5.74–7.11)	7.23 (6.38–7.97)	8.28 (7.11–9.30)	9.08 (7.65–10.3)	9.89 (8.10–11.4)	10.7 (8.48–12.6)	11.8 (9.04–14.1)	12.6 (9.46–15.3)
45-day	6.03 (5.41–6.54)	6.75 (6.05–7.33)	7.90 (7.07–8.59)	8.84 (7.87–9.64)	10.1 (8.74–11.2)	11.1 (9.39–12.4)	12.0 (9.91–13.7)	12.9 (10.3–15.0)	14.1 (10.9–16.7)	15.0 (11.4–18.0)
60-day	6.86 (6.20–7.39)	7.76 (6.99–8.35)	9.17 (8.25–9.90)	10.3 (9.23–11.2)	11.8 (10.3–13.0)	12.9 (11.1–14.4)	14.0 (11.7–15.8)	15.1 (12.1–17.4)	16.4 (12.8–19.3)	17.4 (13.3–20.7)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 37.2661°, Longitude: -107.0512°



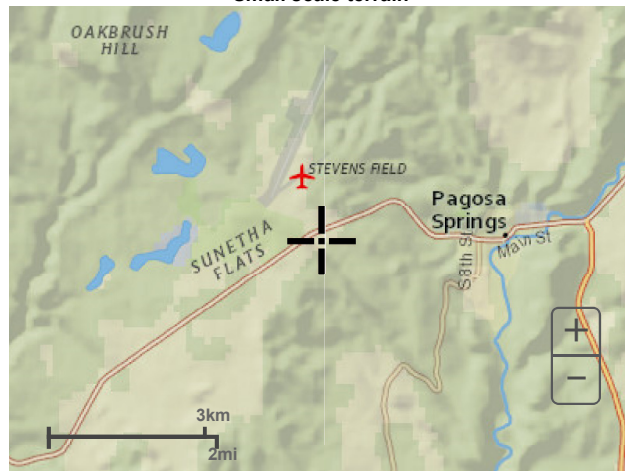
NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Tue Aug 1 20:25:12 2017

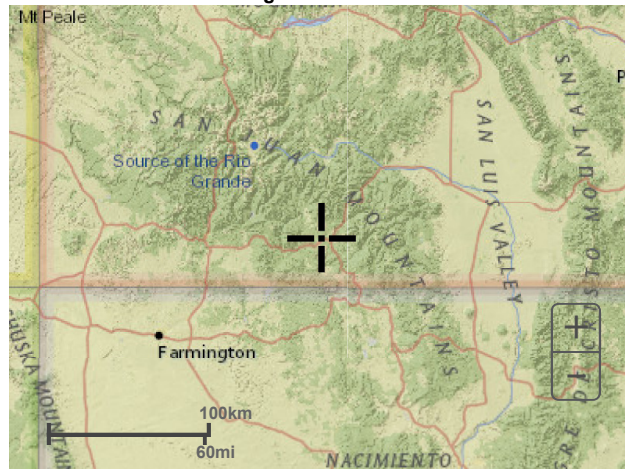
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Maps & aerals

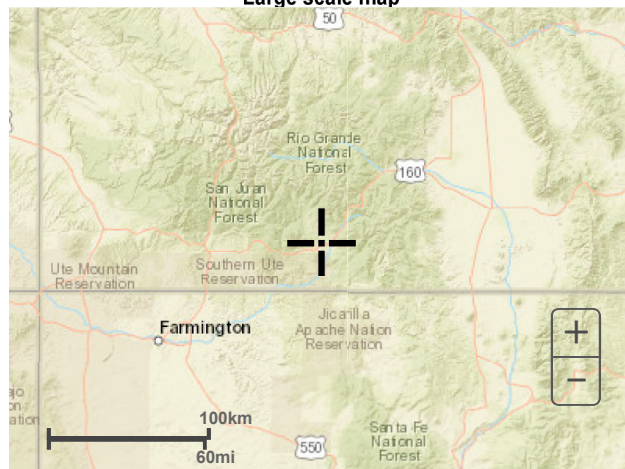
Small scale terrain

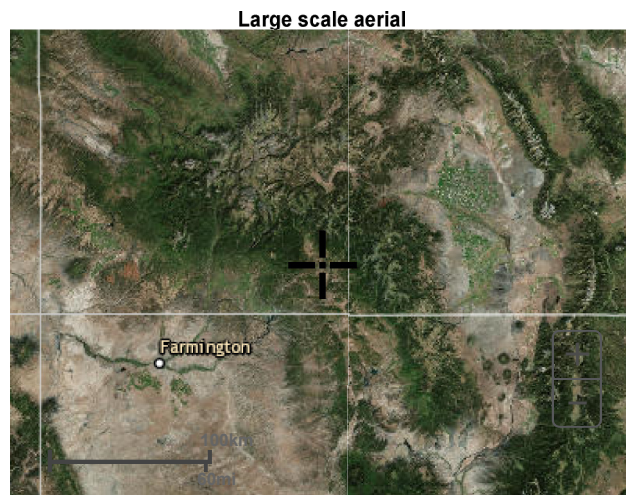


Large scale terrain



Large scale map





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Silver Spring, MD 20910
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Appendix C

NRCS Web Soil Survey Data

Hydrologic Soil Group—Archuleta County Area, Colorado (Harman Park Lot C)



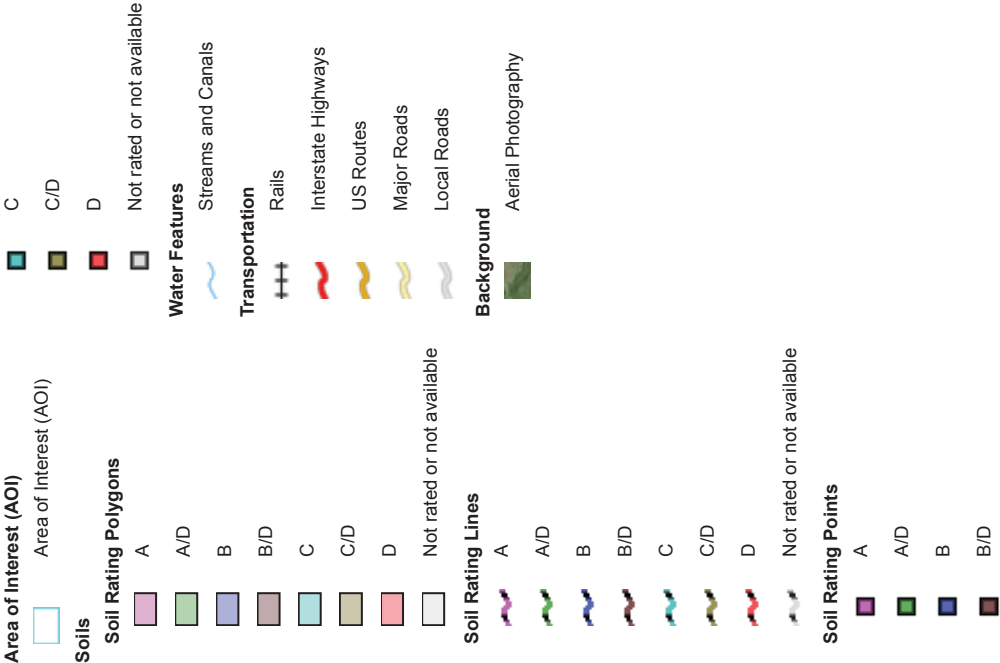
Map Scale: 1:1,110 if printed on A landscape (11" x 8.5") sheet.



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Archuleta County Area, Colorado

Survey Area Data: Version 9, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 8, 2011—Sep 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Archuleta County Area, Colorado (CO668)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
M1-CE	Valto very stony fine sandy loam, 3 to 25 percent slopes	D	4.3	84.7%
M2-CD	Fortlewis fine sandy loam, 5 to 25 percent slopes	D	0.8	15.3%
Totals for Area of Interest			5.1	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix D

HydroCAD Model Output

Arch Cnty Lot C Harman Park JC

Prepared by Davis Engineering Service, Inc.

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Type II 24-hr 2-yr 24-hr Rainfall=1.68"

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6/19/2020

Subcatchment 4S: Historical JC

Runoff = 1.21 cfs @ 12.22 hrs, Volume= 0.113 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

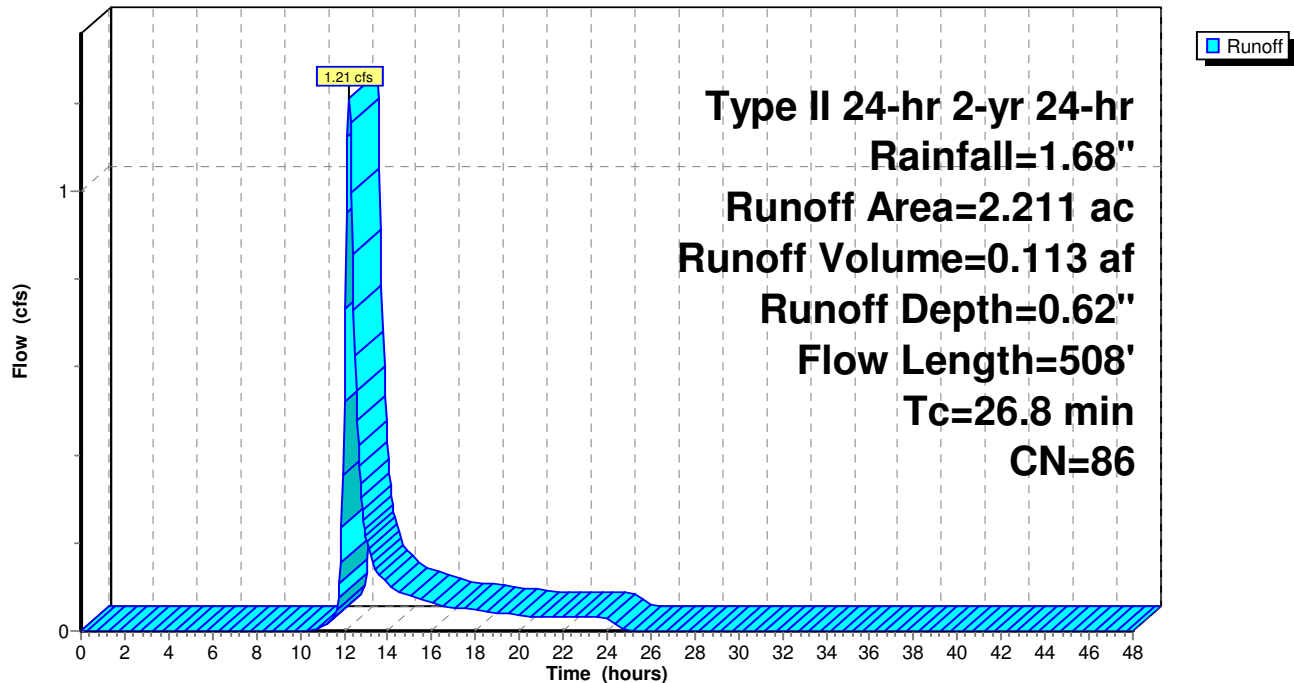
Type II 24-hr 2-yr 24-hr Rainfall=1.68"

Area (ac)	CN	Description
2.211	86	Woods/grass comb., Poor, HSG D
2.211		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	300	0.0300	0.20		Sheet Flow, Sheet Flow Range n= 0.130 P2= 1.68"
1.9	148	0.0176	1.33		Shallow Concentrated Flow, Shallow Concentrated Nearly Bare & Untilled Kv= 10.0 fps
0.2	60	0.0173	5.59	195.78	Trap/Vee/Rect Channel Flow, Roadside Ditch/Toe Bot.W=0.00' D=1.00' Z= 10.0 & 60.0 '/' Top.W=70.00' n= 0.022 Earth, clean & straight
26.8	508	Total			

Subcatchment 4S: Historical JC

Hydrograph



Arch Cnty Lot C Harman Park JC

Prepared by Davis Engineering Service, Inc.

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Type II 24-hr 100-yr 24-hr Rainfall=3.43"

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6/19/2020

Subcatchment 4S: Historical JC

Runoff = 4.19 cfs @ 12.20 hrs, Volume= 0.375 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

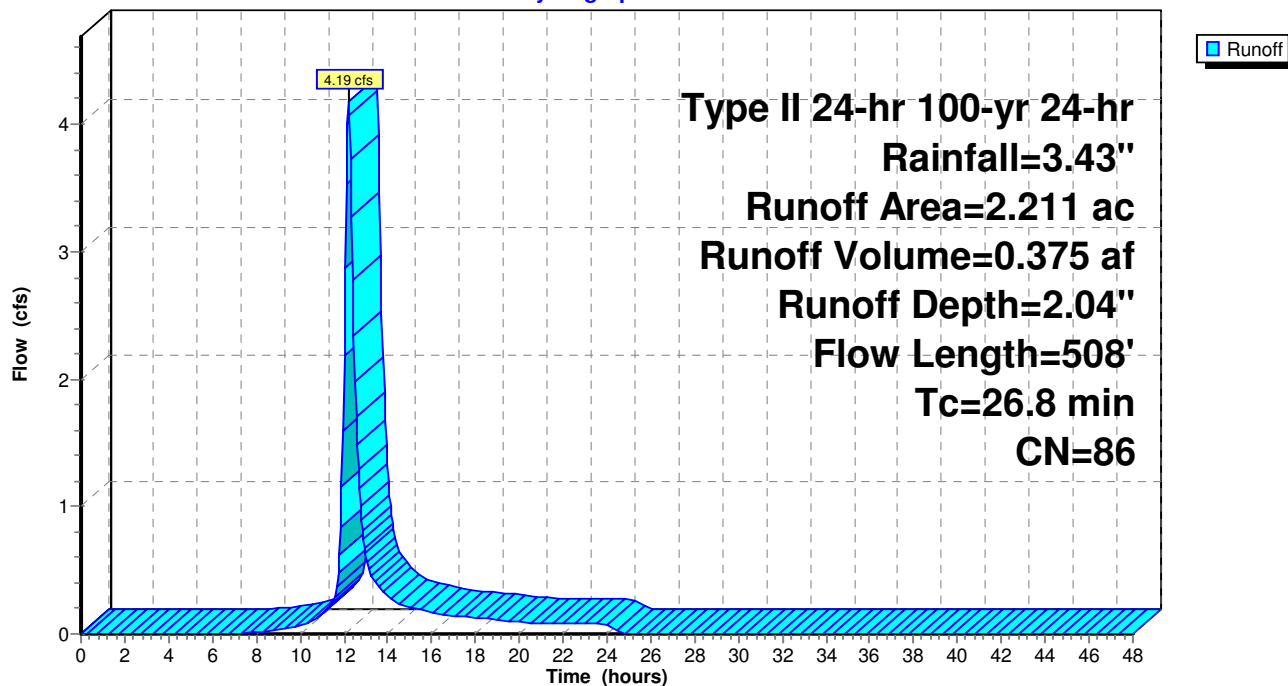
Type II 24-hr 100-yr 24-hr Rainfall=3.43"

Area (ac)	CN	Description
2.211	86	Woods/grass comb., Poor, HSG D
2.211		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	300	0.0300	0.20		Sheet Flow, Sheet Flow Range n= 0.130 P2= 1.68"
1.9	148	0.0176	1.33		Shallow Concentrated Flow, Shallow Concentrated Nearly Bare & Untilled Kv= 10.0 fps
0.2	60	0.0173	5.59	195.78	Trap/Vee/Rect Channel Flow, Roadside Ditch/Toe Bot.W=0.00' D=1.00' Z= 10.0 & 60.0 '/' Top.W=70.00' n= 0.022 Earth, clean & straight
26.8	508	Total			

Subcatchment 4S: Historical JC

Hydrograph



Arch Cnty Lot C Harman Park JC

Type II 24-hr 2-yr 24-hr Rainfall=1.68"

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Subcatchment 5S: Developed JC

Runoff = 3.38 cfs @ 12.00 hrs, Volume= 0.176 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type II 24-hr 2-yr 24-hr Rainfall=1.68"

Area (ac)	CN	Description
0.681	80	Pasture/grassland/range, Good, HSG D
1.530	98	Paved parking & roofs
2.211	92	Weighted Average
0.681		Pervious Area
1.530		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	47	0.0358	0.15		Sheet Flow, Sheet Flow Range n= 0.130 P2= 1.68"
0.1	44	0.0805	5.76		Shallow Concentrated Flow, Sheet Flow Asphalt Paved Kv= 20.3 fps
2.9	376	0.0069	2.14	3.29	Trap/Vee/Rect Channel Flow, Curb & Gutter Bot.W=0.00' D=0.50' Z= 12.0 & 0.3 '/' Top.W=6.15' n= 0.022 Earth, clean & straight
0.2	50	0.0208	4.46	7.88	Circular Channel (pipe), Culvert Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.025 Corrugated metal
8.4	517	Total			

Arch Cnty Lot C Harman Park JC

Prepared by Davis Engineering Service, Inc.

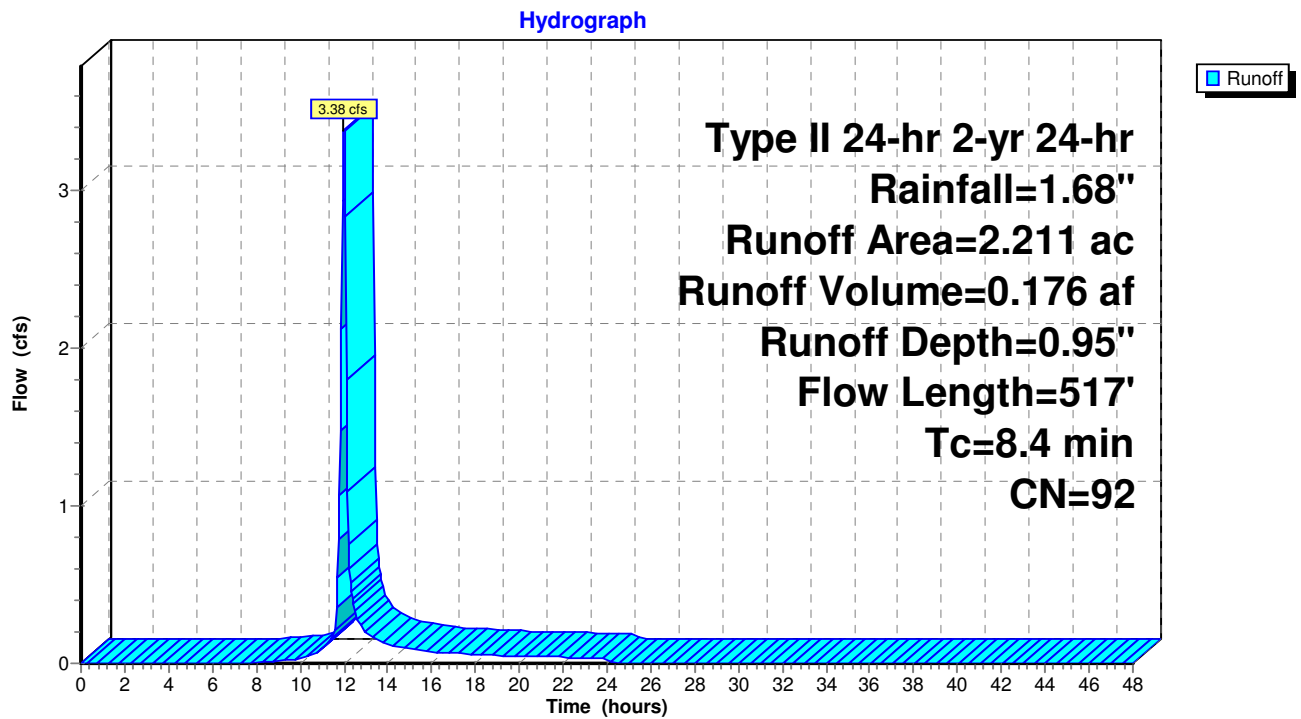
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Type II 24-hr 2-yr 24-hr Rainfall=1.68"

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Subcatchment 5S: Developed JC



Arch Cnty Lot C Harman Park JC

Type II 24-hr 100-yr 24-hr Rainfall=3.43"

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Subcatchment 5S: Developed JC

Runoff = 8.72 cfs @ 11.99 hrs, Volume= 0.473 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type II 24-hr 100-yr 24-hr Rainfall=3.43"

Area (ac)	CN	Description
0.681	80	Pasture/grassland/range, Good, HSG D
1.530	98	Paved parking & roofs
2.211	92	Weighted Average
0.681		Pervious Area
1.530		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	47	0.0358	0.15		Sheet Flow, Sheet Flow Range n= 0.130 P2= 1.68"
0.1	44	0.0805	5.76		Shallow Concentrated Flow, Sheet Flow Asphalt Paved Kv= 20.3 fps
2.9	376	0.0069	2.14	3.29	Trap/Vee/Rect Channel Flow, Curb & Gutter Bot.W=0.00' D=0.50' Z= 12.0 & 0.3 '/' Top.W=6.15' n= 0.022 Earth, clean & straight
0.2	50	0.0208	4.46	7.88	Circular Channel (pipe), Culvert Diam= 18.0" Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.025 Corrugated metal
8.4	517	Total			

Arch Cnty Lot C Harman Park JC

Prepared by Davis Engineering Service, Inc.

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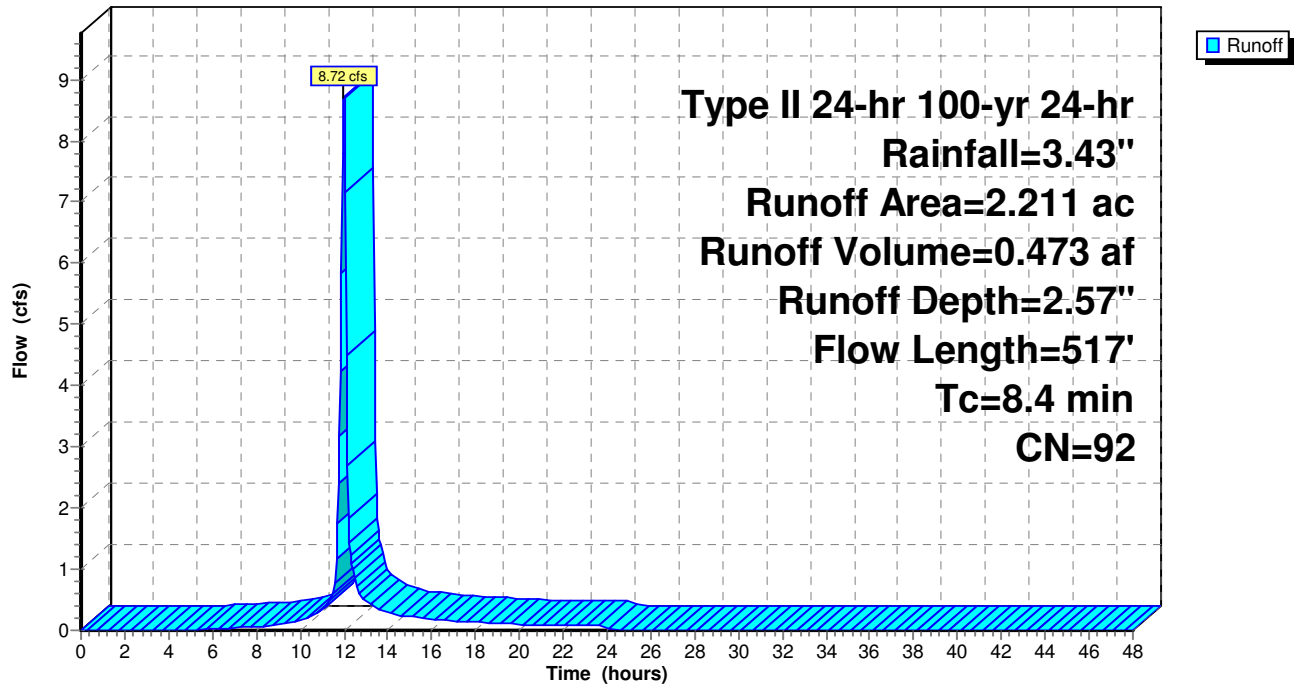
Type II 24-hr 100-yr 24-hr Rainfall=3.43"

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Subcatchment 5S: Developed JC

Hydrograph



Arch Cnty Lot C Harman Park JC

Type II 24-hr 2-yr 24-hr Rainfall=1.68"

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Pond 6P: DC Detention Pond

Inflow Area = 2.211 ac, Inflow Depth = 0.95" for 2-yr 24-hr event
 Inflow = 3.38 cfs @ 12.00 hrs, Volume= 0.176 af
 Outflow = 1.67 cfs @ 12.11 hrs, Volume= 0.176 af, Atten= 51%, Lag= 7.0 min
 Primary = 1.67 cfs @ 12.11 hrs, Volume= 0.176 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 7,596.32' @ 12.11 hrs Surf.Area= 1,841 sf Storage= 1,832 cf

Plug-Flow detention time= 26.0 min calculated for 0.176 af (100% of inflow)
 Center-of-Mass det. time= 25.6 min (848.1 - 822.4)

Volume	Invert	Avail.Storage	Storage Description
#1	7,595.00'	6,083 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

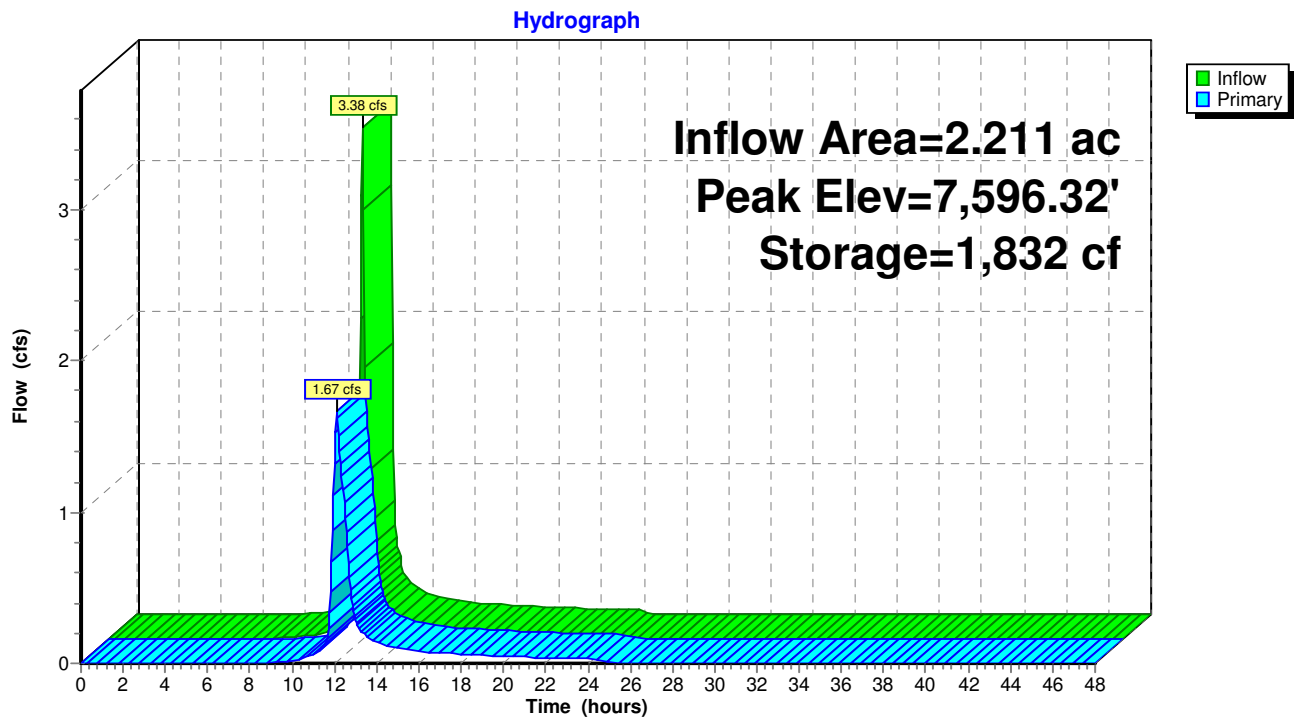
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7,595.00	1,003	0	0
7,596.00	1,564	1,284	1,284
7,597.00	2,424	1,994	3,278
7,597.75	2,995	2,032	5,310
7,598.00	3,190	773	6,083

Device	Routing	Invert	Outlet Devices
#1	Primary	7,597.75'	2.92' x 2.92' Horiz. Orifice/Grate Limited to weir flow C= 0.620
#2	Primary	7,596.12'	7.5" Vert. Orifice/Grate C= 0.620
#3	Primary	7,595.00'	7.5" Vert. Orifice/Grate C= 0.620

Primary OutFlow Max=1.65 cfs @ 12.11 hrs HW=7,596.31' (Free Discharge)

1=Orifice/Grate (Controls 0.00 cfs)
 2=Orifice/Grate (Orifice Controls 0.12 cfs @ 1.54 fps)
 3=Orifice/Grate (Orifice Controls 1.53 cfs @ 4.98 fps)

Pond 6P: DC Detention Pond



Arch Cnty Lot C Harman Park JC

Type II 24-hr 100-yr 24-hr Rainfall=3.43"

Prepared by Davis Engineering Service, Inc.

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Pond 6P: DC Detention Pond

Inflow Area = 2.211 ac, Inflow Depth = 2.57" for 100-yr 24-hr event
 Inflow = 8.72 cfs @ 11.99 hrs, Volume= 0.473 af
 Outflow = 4.02 cfs @ 12.12 hrs, Volume= 0.473 af, Atten= 54%, Lag= 7.4 min
 Primary = 4.02 cfs @ 12.12 hrs, Volume= 0.473 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 7,597.65' @ 12.12 hrs Surf.Area= 2,921 sf Storage= 5,021 cf

Plug-Flow detention time= 21.7 min calculated for 0.473 af (100% of inflow)
 Center-of-Mass det. time= 21.2 min (815.5 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	7,595.00'	6,083 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
7,595.00	1,003	0	0
7,596.00	1,564	1,284	1,284
7,597.00	2,424	1,994	3,278
7,597.75	2,995	2,032	5,310
7,598.00	3,190	773	6,083

Device	Routing	Invert	Outlet Devices
#1	Primary	7,597.75'	2.92' x 2.92' Horiz. Orifice/Grate Limited to weir flow C= 0.620
#2	Primary	7,596.12'	7.5" Vert. Orifice/Grate C= 0.620
#3	Primary	7,595.00'	7.5" Vert. Orifice/Grate C= 0.620

Primary OutFlow Max=4.00 cfs @ 12.12 hrs HW=7,597.64' (Free Discharge)

1=Orifice/Grate (Controls 0.00 cfs)
 2=Orifice/Grate (Orifice Controls 1.68 cfs @ 5.46 fps)
 3=Orifice/Grate (Orifice Controls 2.33 cfs @ 7.59 fps)

Pond 6P: DC Detention Pond

Hydrograph

